AN INVESTIGATION INTO THE USE OF HUMOR FOR COPING WITH STRESS

by

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ABSTRACT

The aim of the present research was to further understanding of how humor is used as a coping strategy and the potential influence of sex, temperament, and situational factors on its effectiveness. Study 1 describes the development of a new measure, the Waterloo Uses of Humor Inventory (WUHI), which was designed to gain a more comprehensive assessment of coping humor than was available with existing measures. The results of exploratory factor analysis indicated 3 factors for the WUHI: Perspective-Taking Humor which describes adopting a humorous perspective on and sharing humorous stories about stressful events and personal short-comings; Aggressive Humor, the use of hostile humor when threatened; and Avoidant Humor, using humor to distract one's self and/or others from immediate stressors. Confirmatory factor analyses proved that the 3-factor solution was replicable and did not differ between the sexes. The 3 subscales also demonstrated good internal consistency and stability. Study 2 and Study 3 examined the validity of the WUHI scales. Study 2 investigated their relationships with previously established measures of humor, personality and coping. Study 3 investigated the ability of the WUHI scales to predict humor behaviour and moods in response to a stressful lab situation. The pattern of associations found with each WUHI scale across studies was unique and, for the most part, predictable based on theoretical considerations. The WUHI scales were also distinct from a measure of cheerful temperament in the prediction of outcomes in response to stress, hence providing support for their incremental validity and potential utility as predictors of behaviour and moods in situations where coping is relevant. The findings are discussed with respect to their implications for clinical interventions and future research.

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This work is dedicated to my parents, for all of their love and support.

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Humor has long been regarded as a characteristic of a healthy personality with particular benefits for coping with adversity (Allport, 1961; Freud, 1928; Maslow, 1954; Valliant, 1992). In spite of the wide-spread acceptance of this assumption, empirical investigation into the potential benefits of humor for coping with stress have yielded mixed results. The two most frequently used measures in the study of the stress-moderating role of humor are the Situational Humor Response Questionnaire (SHRQ) and the Coping Humor Scale (CHS) (Martin & Lefcourt, 1984, and 1983). The SHRQ was designed to assess the extent to which individuals express mirth (i.e., smile and laugh) in a wide range of situations, and the CHS was designed to assess, more specifically, the extent to which people use humor to cope with stress (Martin, 1996). Some studies using these measures have found that higher scores on the SHRQ and the CHS are associated with less mood disturbance under stressful conditions, providing support for humor's function as a stress moderator (Kuiper, Martin, & Dance, 1992; Lefcourt, Davidson, Prkachin, & Mills, 1997; Lefcourt & Martin, 1986; Nezu, Nezu & Blissett, 1988; Trice & Price-Greathouse, 1986). However, other studies, using these same measures, have only found main effects for humor, indicating that individuals who obtain higher scores on the SHRQ and the CHS generally experience less negative affect or arousal across situations than do those with lower scores on these scales (Anderson & Arnoult, 1989; Lefcourt et al.,1997; Porterfield, 1987).

Even when evidence for stress-moderation has been found, exactly how humor functions to minimize distress in adverse situations remains unclear. This is likely due, in part, to the fact that humor has been conceptualized to function as a stress-moderator in two related, but different ways. First, it has been defined as a personality trait that serves as a "buffer" against stress. From this perspective, individuals with a good sense of humor are thought to be less likely to perceive events as stressful than are those with a poor sense of humor. This position

implies that the benefits associated with high scores on humor measures may reflect the influence of a cheerful disposition, which makes high humor individuals less reactive to potential threats in the environment than their less humorous counterparts. On the other hand, humor has also been thought to function as a coping strategy that people use to reduce negative affect once it has been aroused by potentially stressful events. From this perspective, the potential benefits of humor in adversity are thought to result from deliberate attempts to see humor in stressful situations, thus minimizing or reducing their potential negative effects.

Obtaining a clear understanding of how humor functions as a potential stress-moderator has also been hampered by the fact that humor, while often discussed as a coping strategy, has typically been investigated almost exclusively as a personality trait. Research studies that have investigated the benefits of coping humor using a trait approach often identify those who claim to use this coping strategy and their differences on various measures of personality functioning and adjustment from those who report that they do not use humor to cope. However, direct observation of participants' use of humor to cope with stressors is rarely done. This approach is not entirely consistent with the view of humor as a coping strategy, which is more accurately defined as an ability or a skill that is used consciously and deliberately to reduce or minimize distress. If viewed as a skill, then individuals should vary in their capacity to use humor to cope with stress, which should be observable in potentially stressful situations (Martin, 1998).

The fact that the CHS does not distinguish between various types or forms of humor, or the contexts in which coping humor is used, may reflect a trait bias, that all humor is 'good' with benefits for coping with stress. Alternatively, it may reflect a lack of appreciation for the many meanings the word "humor" has in contemporary Western culture. Researchers interested in humor's potentially health-enhancing properties

have spoken about humor as a benevolent, philosophical, smiling attitude towards life that is characterized by a propensity for becoming amused by the imperfections we notice in ourselves and the world in which we live (Lefcourt & Martin, 1986; Ruch, 1998). However, in everyday language, humor is typically used as an umbrella-term incorporating prosocial as well as aggressive or hostile forms of humor behaviour (Ruch, 1998). It is this potential disjunction between the implicit, narrow definition of humor held by researchers interested in its benefits, and the broad definition of humor likely held by the people they study, that may account for the inconsistent and sometimes confusing findings in the literature. For example, Kuiper and Martin (1998), in a review of studies conducted in their labs examining the relationship between humor and other aspects of healthy personality, found that sense of humor, as measured by the CHS, was only weakly and inconsistently related to measures of positive personality traits (e.g., optimism, self-acceptance, positive relations with others, and environmental mastery). They also found that measures of humor such as the CHS and the SHRQ, in comparison to indicators of positive personality such as optimism and autonomy, were less associated with indices of psychological health, such as self-esteem and negative affect. Given these weak findings, Kuiper and Martin (1998) conclude that scores on the CHS and the SHRQ should not be used as indicators of positive and healthy personality functioning. They also suggest that the weak and inconsistent relationships found between indices of psychological health and the humor measures they have used in their research may be due to the fact that such measures "do not seem to distinguish dysfunctional or maladaptive forms of humor from those that are more health-enhancing and beneficial" (pp. 177-178). Indeed, as will be described later in more detail, there is evidence that higher scores on measures such as the CHS and the SHRQ are sometimes associated with worse outcomes under stress, particularly for males. Sex-differences in the literature with

respect to the correlates of measures such as the CHS suggest that males and females may differ in their meanings when they report using humor to cope. Sex-differences, as well as the many other inconsistencies and contradictions in the literature, also suggest that there is much more to be understood about how humor is used, when it is used, and the factors that may limit or enhance its potential benefits for coping with stress.

The inconsistencies in the literature on the stress-moderating role of humor, particularly with regard to sex-differences in humor's potential benefits, inspired us to take a closer look at how individuals use humor to cope with events in their lives. To be clear, for the purposes of this research, coping humor is defined as a skill that is consciously used to "manage (master, reduce, or tolerate) a troubled person-environment relationship" (Folkman & Lazarus, 1985, p. 152). As implied by this definition, coping is viewed as a dynamic, bidirectional process that evolves between an individual and his/her environment (Aldwin & Revenson, 1987; Folkman & Lazarus, 1985; Oakland & Ostell, 1996). The aim of this research is to investigate not only individual differences in the ability to use humor to cope with stress, but also the contextual variables that may influence its effectiveness.

Sex-differences in the use of humor as a coping strategy

Research investigating the stress-moderating effects of humor has typically ignored the role that an individual's sex may play in this process. Typically, the rationale given for this omission is the finding that mean scores on humor measures used to predict outcomes do not differ between the sexes. However, it is becoming increasingly apparent that although mean humor scores on the CHS do not differ between the sexes, the same scores on this measure seem to have different meanings for males and females.

The importance of sex as a predictor variable when investigating the potential benefits of coping humor was emphasized in

a recent study by Lefcourt et al. (1997), which examined humor as a stress-moderator in the prediction of blood pressure during five stressful tasks. Participants were 60 male and 49 female university students who were solicited by posters advertising the need for volunteers to take part in a Challenging Tasks Study. The stressful tasks they completed in the lab, in addition to being difficult, had the potential to threaten the participants' sense of competency in a number of areas. The Stroop Task, which involves identifying the colour of the ink in which words of conflicting colours are written (e.g., the word red written in yellow letters), and the Mental Arithmetic task, which requires participants to serially subtract 13 from 7683, have the potential to cause university students to question their intellect as they find themselves stumbling through tasks which may initially appear simple, but in reality, are almost impossible to complete without errors. The Type A Interview, in which the interviewer poses questions in a challenging manner, and the Favourable Impressions task, in which participants are required to try to impress an unresponsive member of the opposite sex, both served as interpersonal stressors. Finally, the Cold Pressor Task, which requires participants to keep their arm submerged in a circulating bath of ice water, challenges one's ability to withstand physical pain. For each of these tasks used in this study, blood pressure was measured before, immediately after, and following a 3-minute rest period.

In all five stressful tasks, humor, defined by scores on the CHS, interacted with sex in the prediction of systolic blood pressure. Females who obtained high scores on the CHS manifested lower systolic blood pressure at each point of measurement than females with low humor scores. In other words, humor was associated with a generally lower level of physiological reactivity among females. The results for males were more variable. Evidence for humor as a stress moderator was found for males on the Cold Pressor task. However, on all of the other

tasks, males who obtained high scores on the CHS consistently demonstrated higher blood pressure than males who obtained low scores on this scale.

The Lefcourt et al. (1997) study was not the first in which sex differences in the correlates of humor measures were found relevant to understanding the potential stress-reducing functions of humor. In fact, a number of sex-differences with respect to the benefits of coping humor can be found in the early work done by Lefcourt and Martin which investigated the validity of the CHS and the effect of humorous behaviour on observed and subjective indices of distress (Lefcourt and Martin, 1986). One such study (Miller, Lefcourt, Holmes, Ware, & Saleh, 1986) examined humor as a predictor of marital satisfaction, as well as the positive and negative interaction styles that were demonstrated by married couples during role-plays of conflict situations. These researchers found that females' scores on the CHS were significantly and positively related to self-reports of satisfaction and a sense of mastery both in general and specifically within the marriage; however, the same relationships were negligible among males and significantly lower than those found among females. Females' scores on the CHS were also found to be positively associated with engagement behaviours during the conflict resolution exercise. Engagement was defined by explicit statements identifying the issue at hand, straightforward communication about positions, propositions of possible solutions, and a lack of avoidance behaviour. In contrast to females, males' scores on the CHS were essentially unrelated to these indices of engagement, but were positively associated with destructiveness during the role-playing exercise as indicated by non-verbal displays of negative affect and verbally expressed hostility. Significant sex-differences were also found in the relationship between observed laughter during the role-playing exercise and observed engagement, destructiveness and dominance. Males who laughed more often and for longer duration

demonstrated significantly less destructive and dominance related behaviour and also a trend toward less engagement during the role-plays. The frequency and duration of females' laughter, however, was essentially unrelated to engagement and destructiveness and was positively, but not significantly, related to dominance during the interaction.

These findings suggest that females who score higher on the CHS are more likely to engage in active problem-solving and also feel more competent, and satisfied in their marital relationships. While males' scores on the CHS were essentially unrelated to these variables, higher scores on this measure predicted greater negative affect and hostility while they engaged in conflict-resolution exercises with their wives. Miller et al., (1986) did not specify how male hostility had been communicated; however, the positive relationship between males' scores on the CHS and hostility may indicate that during stressful occasions humor may consist of husbands making fun of their wives, which would probably not bode well for the relationship.

Although husbands' laughter demonstrated during the role-plays was associated with less destructive behaviour, it was related to behaviours that may be indicative of conflict avoidance and submissiveness, which in turn, may also have negative implications for the stability of intimate relationships. A recent investigation by Cohen and Bradbury (1997), which examined the effect of negative life events and communication styles on marital adjustment among newlyweds, also found evidence suggesting that husband's humor is prognostic of marital problems. These researchers found that humor demonstrated by husbands during a conflict-resolution exercise, similar to that used by Miller et al. (1986), predicted significant marital difficulties 18 months later if either the husband or the wife had undergone stressful experiences during that time. The authors interpreted husband's humor as a reflection of avoidance in confronting marital problems and a failure

to engage in active efforts to resolve them with their wives. The findings reported by Miller et al. (1986) lend support to this interpretation. Thus, in addition to being associated with a greater tendency to deny problems, male humor may presage failure to cope with marital problems.

Sex-differences with respect to the benefits of coping humor were also demonstrated by an experimental study by Martin and Lefcourt (1984) which compared the impact of creating a humorous narrative, an intellectual narrative, or no narrative on observed and self-reported stress during and after watching a stressful film (*Subincision*). The study found that females in the humorous narrative condition demonstrated and reported significantly less negative affect than females in the intellectual and no-narrative conditions; however, observed and self-reported negative affect among males did not vary as a function of experimental condition. Thus, hypotheses regarding the stress-reducing function of humor were confirmed for females but not for males. The authors offered two hypotheses regarding their failure to find positive effects from the narrative condition among males. Males' had significantly lower negative affect scores in comparison to females in the two control conditions, and therefore, the results may have represented a floor effect among males, such that their negative affect, being low to begin with, could not be significantly reduced. However, the slight, but non-significant trend for males in the humorous-narrative condition to have higher negative affect scores than males in the control conditions led them to speculate as to whether the demands to create a humorous narrative were more stressful for males than for females.

In order to investigate the latter hypothesis, they performed another study with only male participants comparing negative affect between participants who had either created or were provided with humorous or intellectual narratives to accompany the *Subincision* film. No differences were found between the two humor conditions with respect to measures of mirth and mood disturbance. Males in both

humor conditions smiled and laughed more than those in the two intellectual-narrative conditions. However, with respect to mood disturbance, the humor manipulation had its greatest effect on high CHS males. But, contrary to expectation, the high CHS males in both of the humorous narrative conditions revealed a greater increase in mood disturbance than did those in the intellectual-narrative groups. The authors speculated that the lack of confirmation for their hypothesis regarding the stress-buffering role of humor among males might have resulted from the failure of the *Subincision* film to induce significant levels of stress among this sample. In light of similar findings from other studies such as those described above, the results may indicate that self-reports of high use of humor for coping predict few benefits for males.

Sex-differences in the function of humor

What could account for sex-differences with respect to the correlates of coping humor? Why would coping humor be associated with greater benefits for females than for males? Potential answers may lie in a number of studies that have investigated differences in the way males and females use humor in naturally occurring contexts. These studies suggest that humor functions differently for males and females, and in ways that may have implications for its effectiveness as a stress-moderator.

Studies that have investigated the forms and functions of humor in social groups have found consistent sex-differences suggesting that females' use of humor may be more conducive to coping than the way humor is typically used by males. For instance, a number of field studies in which humor has been observed in naturally-occurring contexts have revealed that males are more likely than females to use humor in a competitive manner for the purpose of self-enhancement, whereas females are more likely than males to use humor as a way of sharing and

validating personal experiences and garnering social support (Lampert and Ervin-Tripp, 1998). For example, Fine (1981) found that humor used among preadolescent males consisting largely of obscene jokes and humorous narratives, allowed the speaker to gain control over conversations and to demonstrate sophistication regarding social and sexual issues. Similarly, observations and self-reports of humor among younger children and adults suggest that males are more likely than females to tell jokes, engage in clowning, and to make fun of others (Abrahams, 1962; Crawford & Gressley, 1991; Dundes, et al. 1970; Gossen, 1976; Groch, 1974; McGhee, 1976). In contrast to males, female humor has been found to be more supportive, collaborative, and typically involves sharing humorous stories about real life experiences. For example, Jenkins (1985), found that among groups of female adolescents and adults, humorous observations about life events shared by one person were typically responded to in kind by other group members as a way of showing support and validating the speaker's experience. Sanford and Eder (1984) also found that teenage girls often constructed humorous stories collaboratively and that most of their humor was in the form of stories as opposed to jokes.

Females' tendency to share humorous stories about their experiences may not only serve as an effective means of obtaining social support, but also suggests an ability to laugh at one's self. Indeed, Lampert & Ervin-Trip (1998) in their content analysis of natural conversations in same-sex and mixed-sex groups found that females' humorous stories were largely self-deprecating in nature. Self-deprecating humor, or the ability to laugh at one's self, has been thought to be central to humor's functioning as a stress-moderator (Allport,1961; Freud, 1928; Lefcourt & Martin, 1986; Lefcourt, et al., 1997; Lefcourt & Thomas, 1998; Maslow, 1954; May, 1953; O'Connell, 1976; Valliant, 1977). Self-deprecating humor has also often been identified as more typical of female than of male humor. Levine (1976), for example,

found female comics depreciated themselves in about 63% of their monologues whereas males made fun of their personal short-comings only 12% of the time. However, Lampert and Ervin-Trip's more recent investigation into the use of humor in natural contexts (Lampert & Ervin-Trip, 1998) has found that in mixed groups, males are in fact more likely than females to use self-deprecating humor, but are less likely than females to make fun of themselves when interacting with other men. Interestingly, females are also more likely to engage in self-deprecating humor when interacting with other females, and are less likely to do so when in the company of males. When in male company, females' humor takes on male characteristics, that is, they are more likely to tell jokes than they are to make fun of themselves or share humorous stories about their own experiences. Thus it appears that, in naturally occurring contexts, males and females both tend to use self-deprecating humor, but reserve it for female audiences.

Rather than finding differences in the targets of male and female humor, closer analysis of the data revealed sex-differences in the forms and functions self-deprecating humor was likely to take. Consistent with previous findings, Lampert and Ervin-Trip found that the self-directed humor shared among females was communicated through humorous anecdotes about silly or bizarre personal experiences. Females' use of self-deprecating humor in this context seemed to invite others to join them in laughing at themselves, and functioned as a way of validating their experiences and obtaining social support. In contrast, the self-deprecating humor shared by males in mixed company was less intimate, consisting primarily of wild exaggerations offered for their entertainment value, or wise cracks, which functioned to change the subject or minimize socially unacceptable attitudes and behaviours.

Initial investigation into sex-differences in humor behaviour associated with the CHS

Although the study described by Lampert and Ervin-Tripp (1998) did not replicate previous research in which males are found to engage in aggressive humor more than are females, their results do provide additional evidence that male humor, moreso than female humor, appears to be used in order to gain control of social situations. These findings, and others regarding sex-differences in humor behaviour, caused us to question whether such differences could help in comprehending the manner in which males and females use humor to cope. Could the negative outcomes associated with males' scores on the CHS reflect a failed attempt at trying to gain control of a stressful situation by joking and/or using aggressive humor? Conversely, could the benefits associated with females' coping humor derive from their tendency to make fun of themselves as they tell humorous stories about their stressful experiences? In an attempt to answer these questions, we conducted a pilot study investigating humor behaviour associated with the CHS scores of men and women.

Participants were chosen from a pool of Introductory Psychology students at the University of Waterloo who had completed the CHS during a mass testing procedure and who scored either one standard deviation above or below the mean (n= 137; 64 males and 73 females). Once in the lab, each participant completed a measure of their current mood, some humor questionnaires, and two behavioural measures of coping humor that we developed. The first behavioural measure was the "Quip Task". For this task, each participant was left alone in a room to listen to audio-taped narrations of 6 potentially embarrassing situations (See Appendix A, pp. 162 for transcripts of these narratives). The participant was asked to try to picture him/herself in each situation while listening to each scene, and then, when prompted, to say the funniest thing he/she could imagine saying if the situation was real. An example

of one of the narrated scenes to which participants were asked to respond ("The Dinner"), described how the subject accidentally sent a potato flying through the air and onto the lap of the hostess of a formal dinner party, the hostess being the mother of his/her significant other, whom he/she is meeting for the first time. Participants were given 20 seconds to respond, and made their responses into a tape recorder, which ran continuously for the duration of the task. After completing the Quip Task, each participant was taken to another room to complete the second behavioural humor measure, the "Story-Telling Task". This room was equipped with a comfortable chair, soft lighting, and a telephone which was connected to a tape-recorder. Participants were told to imagine sitting in a room at home and to recall two of the scenes they heard during the Quip Task: The Dinner scene described previously, and a scene which we called the "Exposing Speech" which described giving a speech in front of a large group of people, during which the respondents find that their blouse or pant's zipper was open. After confirming their recollection of these two particular scenes, participants were asked to imagine that both of the situations had actually happened to them. They were then asked to think of a friend with whom they usually share their experiences, and then pretended that they were telling these stories to that friend who they were to picture listening on the other end of the telephone. In addition, for the final task, participants were asked to tell a story of their own about a funny situation that had actually happened to them. In this way we hoped to observe their use of humor in a less contrived situation.

Coders blind to the respondents' CHS scores rated the responses for funniness, the direction of comment (self, neutral, or other), aggression (self vs. other directed) and for the presence of laughter while listening and responding to the scenes. It was hypothesized that the CHS would interact with sex in predicting the focus of participants' humor responses on both the quip and story-telling tasks. More specifically, the

CHS was hypothesized to be a stronger positive predictor of self-directed humor among females than males, and a stronger positive predictor of other-directed humor among males than females. Based on the findings regarding sex-differences in the preference for and use of different forms of humor, it was also expected that the CHS would be better at predicting males' funniness on the quip task and a better predictor of the funniness of females' stories. All other analyses performed were exploratory.

Each of the dependent variables on the quip and story-telling tasks was subjected to hierarchical regression analyses. Humor, measured by the CHS, sex, and the interaction between sex and CHS scores were the predictors and mood upon entering the lab was used as a covariate in all analyses. Situational mood was anticipated to influence participants' performance on the humor tasks, but was not of primary interest. Hence, it was treated as a covariate in order to increase the precision of the analyses investigating the relationship of the CHS and Sex to the humor performance criteria.

Results of statistical analyses demonstrated partial support for our hypotheses. Contrary to our expectations, but consistent with Lampert & Ervin-Tripp (1998), the CHS was not a stronger predictor of self-directed humor among females than among males on either of the behavioural tasks. In fact, only one sex-difference regarding the relationship of the CHS to the direction of humor was found: males were more likely than females to make self-deprecating jokes in response to one of the items on the Quip Task. However, sex did moderate the relationship between the CHS and rated funniness of participants' responses on this task. The CHS was significantly and positively related to the humorousness of male responses on the Quip task, but did not predict the humorousness of female quips. Interestingly, the opposite pattern was found in the prediction of laughter to the scenes. The CHS was positively related to females' laughter, but did not differentiate laughter among high and low CHS

males. Also, contrary to expectation, the CHS did not interact with sex in the prediction of the humorousness on the story-telling task; stories told by both males and females who obtained higher scores on the CHS were judged to be funnier than those told by participants with lower CHS scores.

Although the results from this study provided only partial support for our hypotheses, they do suggest that males and females may behave differently with respect to humor in trying circumstances. During potentially stressful situations, males who use humor to cope with difficulties may make more humorous comments than less humorous peers, whereas females prone to humor use for coping may laugh more than their less humorous peers. Also, while females were not better than males at telling humorous stories, the results of the quip and story-telling tasks combined suggest that male coping humor includes both making funny quips and telling funny stories, whereas only humorous story-telling is relevant for female coping humor. The fact that the CHS was found to be associated with different humor behaviours between the sexes may have important implications for the effectiveness of humor as a moderator of stress for men and women.

The influence of situational factors on the use and effectiveness of humor for coping with stress

Coping humor: When the only thing to do is laugh

Humor is most often spoken about as a form of emotion-focused coping. Emotion-focused coping is aimed at reducing or managing emotional distress and occurs most often when people believe that nothing can be done to alter the source of stress itself. Therefore, it is to be expected that humor would be used most often and most effectively in response to situations appraised as having to be endured either because they are chronic and beyond control, or because they have already

occurred, and hence, cannot be changed.

Carver et al. (1993), in a study which examined the relationship between optimism, coping, and distress among women being treated for breast cancer, found evidence to suggest that humor can reduce distress experienced in response to a chronic stressor. These researchers found that the use of humor as a coping strategy as measured by the COPE (Carver et al., 1989) was significantly and negatively related to distress at one week and six months post-surgery. In addition, prospective analyses demonstrated that the use of humor at three months post-surgery predicted significantly less distress three months later (six months post-surgery). Lefcourt et al. (1997) have also suggested that humor may be most beneficial in situations that have to be endured. The Lefcourt et al. (1997) study, which examined humor as a stress-moderator during five stressful tasks, found evidence for the moderation hypothesis on only one task, the Cold Pressor Task, and then, only among males. The authors noted that, unlike the other four stressful tasks, the Cold Pressor required passive endurance rather than active problem solving. They concluded that tasks requiring more active problem-solving efforts might not be as amenable to the impact of humor as are stressors experienced as uncontrollable.

Humor as a problem-focused coping mechanism

Although most often described as an emotion-focused coping strategy, humor can be used to alter a stressful situation, and thus, can also function as a form of problem-focused coping. Using humor to change the nature of a stressful social interaction, such as telling a joke to placate someone who is angry or to defuse a tense situation, are some examples. Unlike humor that is used to manage reactions to a stressor, humor that is used to take control of an external problem situation is a much riskier endeavor, requiring an adept sense of timing, and strong humor production skills. The success of this strategy is also dependent

on the receptivity of the audience, which is a function of a number of factors such as the speaker's status, his/her relationship with the audience, and the audience's capacity to appreciate humor in the situation. Making a joke during a stressful event may also be incompatible with being able to concentrate on aspects of the situation that demand attention. Therefore, in addition to the possibility of not being well-received, using humor to gain control over a stressful interaction may be less effective than coping with one's own emotions given its greater demands on personal resources.

The distinction between the use of humor as a form of emotion-focused vs. problem-focused coping may be relevant to understanding the sex-differences discussed earlier. The pilot study we conducted indicated that reports of using humor to cope, as measured by the CHS, predicted females' laughter and the humorousness of males' quips in response to simulated, potentially stressful situations. This difference may indicate that, during a potentially stressful situation, females use humor to gain control of their emotional responses, whereas males use humor in an attempt to gain control over the situation itself. That females' reports of using humor to cope predict a greater sense of mastery and satisfaction in their lives and specifically within their marriages, and less physiological reactivity in response to challenging tasks, may reflect this ability to use humor to gain control of their emotional reactions in the face of an external stressor. In contrast, the fact that males' reports of using humor to cope predict destructiveness while trying to resolve conflicts with their wives, and greater physiological reactivity in response to challenging tasks requiring active problem-solving, may reflect a greater tendency to make jokes in an attempt to alter stressful circumstances, which is likely to be inappropriate or ineffective in conflictual or mentally challenging situations.

The Purpose of this Research

As illustrated by this literature review, existing measures of the use of humor for coping may identify those who are more likely to use humor to cope with life events, but do not assess how or when it is used as a coping strategy. The purpose of this research is to gain a better understanding of how humor is used as a coping strategy and the contextual variables that may influence its effectiveness with particular attention paid to sex-differences. Study 1 describes the construction of a new questionnaire measure, the Waterloo Uses of Humor Inventory (WUHI), which was designed to gain a more comprehensive assessment of the ways in which males and females use humor to cope than was available with the CHS. Study 2 evaluates the construct and discriminant validity of this new measure and existing humor scales (the CHS and the SHRQ) by examining their relationships with other measures of coping and personality. Study 3 likewise investigates the construct and discriminant validity of the WUHI, CHS, and the SHRQ, as well as their incremental validity over and above trait-cheerfulness, in the prediction of mood and behaviour both during and after an acute stressor created in the lab.

STUDY 1

The purpose of this study was to develop a new measure, which would provide a detailed assessment of coping humor. This new measure was not only designed to assess the extent to which individuals employ humor as a coping strategy, but it was also hoped that it would allow for a better understanding of how humor is used to cope with stress. Consistent with the aim of defining coping humor comprehensively for males and females, the items were designed to tap many possible ways in which humor could be used to cope. In doing so, a number of dimensions were considered. Of primary importance for furthering our understanding of humor as a coping strategy is assessing the functions of humor. Hence this dimension had the greatest influence over item development. Subsumed within the broad functions of humor, dimensions representing more specific aspects of the context for humor were also considered. These dimensions included: the forms of humor (public vs. private); the timing of humor (during vs. after stress); modes of humor expression; and emotion specific humor.

1) The Different Functions of Coping Humor:

Coping humor has typically been described as a way of distancing one's self from potential stressors and gaining perspective upon one's self and one's experiences. Events that could potentially promote negative emotions are defused or transformed to elicit positive affect (Freud, 1928; Lefcourt & Martin, 1986; Lefcourt, 1996; May, 1953; O'Connell, 1976). This ability to find humor in adversity and to not take one's self too seriously has often been said to be the most beneficial way in which humor can be used to deal with stress. It was primarily with this assumption that the CHS was developed (Lefcourt & Martin, 1986). Indeed, a number of studies have found that the CHS is related to the ability to laugh at one's self and to adopt a positive

perspective on threatening events (Kuiper, Martin & Olinger, 1993; Kuiper, McKenzie, & Belanger, 1995; Lefcourt & Martin, 1986; Rim, 1988). Interestingly, in one of these studies the positive relationship between the CHS and perspective taking was found among an all female sample (Kuiper, Martin & Olinger, 1993), and in those studies where both males and females were equally represented, the relationship between scores on the CHS and perspective taking was found to be stronger among females than among males (Lefcourt & Martin, 1986; Rim, 1988).

While transforming negative affect through the adoption of a humorous perspective may be one of the functions of coping humor as measured by the CHS, the CHS items offer little information about *how* humor is used as a coping strategy. One example of humor use that could add to our understanding of humor as a coping tool involves social comparison. Superiority theories of humor describe it as a way of exerting one's superiority over others through disparagement. This use of aggressive humor and wit to exert dominance and superiority, more typical of humor that males appreciate (Crawford & Gressley, 1991; Hassett & Houlihan, 1979; Levine, 1976; McGhee, 1976; Zillman & Stocking, 1976), may characterize the way in which males use humor as a coping strategy. Such aggressive humor or wit may be effective if one is confronted with an external threat as it can help to restore a sense of mastery and self-esteem (Lefcourt & Martin, 1986; Levine, 1976). However, this type of humor, which is associated with competition and attempts at control, may be less effective than self-directed humor when one is on the receiving end of an uncontrollable stressful situation. In addition, this type of humor, instead of minimizing feelings of negative affect, may help maintain or even increase the feelings of anger and hostility initially aroused by the event.

Another function of humor may involve its use as a way of avoiding or distracting one's self from thoughts and situations that

promote anxiety, such as by imagining funny things, or by making jokes and acting silly to avoid dealing with a social stressor. Using humor to avoid anxiety by thinking funny thoughts may help the individual achieve emotional distance while in a potentially stressful situation. However, alternatively, imagining funny things during a potentially stressful situation may have the ironic effect of increasing the strength of the anxiety-provoking thoughts one is trying to avoid (Wegner, 1994). Acting silly and joking in order to avoid dealing with a potentially stressful social situation could also have limited benefits, as such behaviour may not be well-received and may even promote anger and frustration in others.

A fourth function of humor is in its use as a way of garnering social support and promoting affiliation during times of difficulty. While obtaining social support may be one of the benefits of publicly expressing humor, it is possible that individuals may consciously use humor to minimize feelings of isolation during times of stress. For example, bringing people together through laughter may help to promote cohesion during potentially stressful situations that have an impact on an entire group. Receiving the reward of laughter from others in response to sharing one's humorous perspective on a stressful event may also have a positive impact on the individual. For instance, when others laugh, they communicate their ability to relate to the speaker's experience. Talking about stressful experiences with others in a humorous manner may also prompt others to do the same, which is likely to increase the individual's sense of interpersonal connectedness.

Therefore, in order to obtain a sampling of these functions that humor may serve, items were created to measure 1) perspective taking humor (humor which functions to transform one's negative emotions about an event), 2) aggressive humor (which functions to maintain or repair one's status or self-esteem), 3) avoidant humor (which functions to avoid anxiety provoking thoughts or situations), and 4) affiliative humor

(which is used with the intent of gaining social support).

2) Private vs. Public Forms of Humor

Humor is often thought to be the domain of the extravert. Sharing a humorous perspective about a stressful event not only has the potential benefit of transforming negative affect associated with the stressor, but, as previously mentioned, it may also engender social support. However, including items that only capture public expression of humor would exclude those private responses of individuals who manifest a humorous perspective on potentially stressful events through bemusement and 'inner chuckles' rather than sharing of perspectives with others. Therefore, items were included that would capture the content of private humorous musings as well as public expression of humor.

3) Coping Humor Used During vs. After the Event

As previously discussed, the potential benefits of humor for managing stress might be dependent on timing. Whether or not individuals use humor during or after an uncontrollable stressor might have little bearing on its effectiveness. However, the timing of humor is likely relevant for coping with situations that demand action in order to change the stressor itself. In such circumstances, humor might provide greater benefit for coping in the aftermath rather than during situations that place high demands on problem-focused coping. Items were therefore created to assess the use of humor for coping both during and after a stressful event.

4) Different Modes of Humor Expression

The results of our pilot work suggest that males and females may engage in different humor behaviours as a means of coping with stress. Sex-differences in the relationship of the CHS to indices of humor

behaviour during a series of simulated potentially stressful situations suggested that males might be more likely to make jokes and that females might be more likely to laugh in the face of stress. In contrast to joking and laughter, the relationship of the CHS to the humorousness of participants' stories suggested that humorous story-telling is equally relevant to male coping as it is to female coping. Given these considerations, an effort was made to create items that sampled these three different ways in which coping humor could be expressed.

5) Humor Used to Cope with Different Emotions

The type of emotion aroused by a stressful event likely influences the kind of humor used to cope with it. Some of the functions of humor previously described are assumed to be associated with a narrow range of emotional experiences. For example, aggressive humor is motivated primarily by hostility, and avoidant humor is assumed to manage anxiety. In contrast, perspective-taking and affiliative humor could be used to cope with a broader range of emotional experiences. Although redundant with some functions of humor, items were created that described using humor to cope with anger and anxiety, as well as embarrassment and general distress.

Item development and selection

The dimensions describing the different functions of coping humor (i.e., perspective-taking, aggressive, avoidant, and affiliative), the forum in which coping humor occurs (i.e., privately or publicly), and the timing with which coping humor is used (i.e., during or after the event), were combined factorially to define important areas of item content. Some of the combinations were eliminated because they did not make conceptual sense and/or described behaviours that would probably be infrequently endorsed. For example, items involving the combination of private and public forms of avoidant humor occurring after the event

were not included since avoidance of anxiety provoking thoughts or situations, by definition, can only be used when the anxiety- provoking stimulus is present. As a result of this process, a total of eight "sensible" types of item content were created. The items created within the broad domains also described the different forms of humor expression (i.e., jokes, laughter, and humorous story-telling) and the different emotions with which humor could be used to cope (i.e., anger, embarrassment, anxiety, and general distress). (See Appendix B, pp. 166 for a complete list of the domains and the items generated).

Of the 39 items generated, 32 were retained for the questionnaire. The items eliminated either suffered from wording difficulties, or were thought to have a low probability of being endorsed. The questionnaire asks respondents to rate the extent to which they engage in each of the humor behaviours described on a 5-point scale. The 5-point scale was similar to that used in the Humor Use in Multiple Ongoing Relationships measure (HUMOR; Manke et al., 1996), which assesses the extent to which children engage in specific humor behaviours with significant others. Response options ranged from "1 – Never (not at all)" to "5 – Always (all the time). (See Appendix C pp. 169 for a copy of the Waterloo Uses of Humor Inventory.)

In order to determine how the items converged, the questionnaire was given to a sample of undergraduate students with the intent of performing exploratory factor analyses on the data collected. It was hypothesized that the results of an exploratory factor analysis would reflect the different functions of coping humor outlined above: factors describing perspective-taking, aggressive, avoidant and affiliative humor would be represented. However, given the anticipated overlap between affiliative humor and various types of public humor, it was also thought that, rather than being represented by a distinct factor, items describing affiliative humor may be subsumed under factors describing forms of perspective-taking and avoidant humor. Thus, it was also hypothesized

that the results of an exploratory factor analysis may indicate that the data could be represented by a three-factor, rather than a four-factor model.

METHOD & RESULTS

Participants

The Waterloo Uses of Humor Inventory (WUHI) was completed by two samples of Psychology 101 students at the University of Waterloo as part of a mass testing procedure in the spring term of 1997 (N=194) and again in the winter of 1998 (N=387). Combined, there was a total sample of 581 respondents (281 males, and 300 females). All participants received course credit for completing the mass testing questionnaire booklet.

Exploratory Factor Analysis

A principal-components exploratory factor analysis with an oblique rotation (Oblimin) was performed on the ratings from the combined sample. An oblique rotation was performed, as it was expected that the factors reflecting the different ways of using humor would likely be correlated. Six components had eigenvalues greater than 1. After rotation, four components remained which were well defined by items loading uniquely on each of them. The other two factors were less well defined, including items with cross-loadings on other factors. As expected, three of the four well defined factors reflected the functions of coping humor described above. Factor 1, named Perspective-Taking Humor, described adopting a humorous perspective on past events, Factor 2, named Aggressive Humor, included items that described private and public forms of hostile humor in response to a perceived threat, Factor 3 named Distraction, described thinking funny thoughts to distract one's self from other distressing thoughts, and Factor 4 named Joking, described joking in order to avoid acknowledging and confronting a stressor in the external environment. The last two factors, named Humorous Story-Telling and Self-Deprecating Humor, respectively, contained items that had sizeable loadings (at least .3) on other factors (see Table 1).

Table 1: Interpretation of the Pattern Matrix Following Principal Components Exploratory Factor Analysis with an Oblique Rotation (N=281 males, 300 females)

ITEMS	COMPONENTS					
	1	2	3	4	5	6
Factor 1: Perspective Taking						
27. When others laugh in response to stories I tell about embarrassing experiences, I realize how silly it was to get upset about them in the first place.	**.71**	--	--	--	--	--
16. I laugh to myself about my past mistakes, even though I didn't think they were amusing at the time they happened	**.66**	--	--	--	--	.21
22. I laugh to myself when I think of the embarrassing things I have done in the past.	**.66**	--	--	--	.15	.34
18. I am able to see humor in events that I had once experienced as being quite distressing	**.65**	--	.16	--	.18	--
19. It makes me feel better when I share stories about my past embarrassments	**.63**	--	--	.25	.26	--
Factor 2: Aggressive Humor						
15. I privately make fun of people when they bother me	--	**.88**	--	.15	--	--
12. I privately make fun of people when I feel they are mistreating me	--	**.85**	--	.12	--	--
30. I make fun of the irritating people in my life when I'm with my friends	.15	**.81**	--	--	--	.11
21. When someone is angry with me, I don't laugh out loud, but I privately make fun of their behaviour	--	**.68**	.12	--	--	--
26. I respond to people who are insulting or rude to me by making fun of them in front of others	-.15	**.64**	--	.25	--	--
32. I try to find something or somebody else to make fun of when I feel I have made a fool of myself	-.10	**.59**	--	.21	.11	--
23. When someone makes fun of my short-comings, I will reply by poking fun at them.	-.13	**.50**	-.11	.24	--	.24
Factor 3: Distraction						
28. I try to make myself think of funny things when I find that my mind is filled with worrisome thoughts	.14	--	**.75**	.12	--	--
5. I change my moods at times of crisis by imagining funny things	--	--	**.75**	--	.15	.12
14. I try to find something to laugh at when I feel myself becoming upset	--	--	**.73**	--	.14	--
2. I try to think of something amusing to distract myself from my own fears or worries	--	--	**.60**	.22	--	--

Factor 4: Joking						
1. I tell jokes to make others laugh when I feel that a situation is getting too tense	--	--	.11	**.63**	.22	--
9. I tell jokes or recount funny things I have seen on TV when I feel uncomfortable during a long silence in a group conversation	--	--	--	**.60**	--	--
10. I deal with people who are angry or upset with me by trying to make them laugh	--	--	.16	**.59**	.14	.11
29. Other people tell me that I make jokes or act silly to avoid dealing with serious matters.	--	.18	.24	**.53**	.18	.15
20. I laugh and joke as a way to avoid talking about something that is bothering me.	.12	.12	.15	**.52**	.26	.18
Factor 5: Humorous Story-Telling						
7. While I am in an irritating or awkward situation, I start thinking about how I would talk about it in a funny way to my friends	--	.15	**.32**	--	**.55**	.12
13. Immediately after something upsetting has happened to me I tell my friends about it in a humorous way	--	.16	**.37**	--	**.54**	--
6. I share stories about my more embarrassing moments to make people laugh	**.35**	--	-.15	.23	**.52**	--
3. I tell funny stories about situations that have made me angry in the past	.26	--	.15	--	**.51**	--
Factor 6: Self-Deprecating Humor						
4. I laugh privately to myself about my short-comings	.12	--	**.36**	.17	--	**.66**
25. When I make a mistake or do something embarrassing, I laugh first so people will laugh with me and not at me	--	.13	-.11	.25	.14	**.61**
8. I make fun of my short-comings before anyone else can	--	--	--	.13	**.32**	**.59**
31. I privately make fun of myself when I make mistakes or do something embarrassing	**.34**	--	.14	--	.22	**.59**

Note: 1. All factor loadings greater than .3 are written in bold.

2. "—" represents factor loadings <.01

3. Factors 4, 5, and 6, had negative loadings. They were reflected (all factor loadings were multiplied by –1) in order to aid interpretation.

4. Items 11, 17, and 24 did not load uniquely on any factor

Inter-factor Correlations

Low correlations between the factors resulting from the exploratory factor analysis were found (see Table 2). However, because the intended use of the scale was to eventually assign scores based on

participants' responses to each of the subscales, unit-weighted composite scores for each factor were calculated (i.e., scores for items within each factor were summed) and correlations were run among them (see Table 3). The correlations among these composite scores were notably higher than the inter-factor correlations reported in Table 2.

Table 2: Inter-Factor Correlations for the 6 factor model of the WUHI (N= 581)

	Perspective-Taking	Aggressive	Distraction	Joking	Story-Telling
Perspective-Taking	---				
Aggressive	.10	---			
Distraction	.25	.14	---		
Joking	.23	.35	.27	---	
Story-Telling	.26	.13	.12	.22	---
Self-Deprecating	.37	.19	.21	.24	.19

Table 3: Correlations among unit-weighted factor scores of the 6-factor model of the WUHI (N= 581)

	Perspective-Taking	Aggressive	Distraction	Joking	Story-Telling
Perspective-Taking	---				
Aggressive	.18**	---			
Distraction	.42**	.21**	---		
Joking	.39**	.43**	.54**	---	
Story-Telling	.57**	.32**	.49**	.49**	---
Self–Deprecating	.59**	.32**	.47**	.49**	.54**

Note: **p<.01

The unit-weighted composite scores representing Perspective-Taking Humor correlated most strongly with those representing Humorous Story-Telling, and Self-Deprecating Humor, which is not surprising given the fact that all three factors describe adopting a humorous perspective in slightly different contexts. Perspective-Taking Humor refers to the adoption of a humorous perspective about past events; Humorous Story-Telling describes the sharing of a humorous perspective on potentially stressful events with others; and Self-Deprecating Humor depicts the seeing of one's self and one's short comings from a humorous perspective. Given the high correlations and conceptual similarity among these composites, it was hypothesized that they could be represented by one factor involving the use of Perspective-Taking Humor in different contexts.

The unit-weighted composites for Distraction and Joking were also substantially correlated. The composite scores for both of these factors shared correlations of similar magnitude with composite scores for other factors (e.g., Humorous Story-Telling, and Self-Deprecating Humor). However, given the unique conceptual overlap between Distraction and Joking, it was hypothesized that they too could be represented by one factor. Both factors represent different ways of avoiding anxious or upset feelings. Unlike the other factors, instead of using the stressful event as content for humor, Distraction and Joking involve the use of humor as a means of avoiding stressors in one's immediate environment and the feelings aroused by them.

Exploratory Factor Analysis Specifying Three Factors

After considering the conceptual similarity and the strong correlations between unit-weighted composite scores for the Perspective-Taking Humor, Humorous Story-Telling, and Self-Deprecating Humor factors, as well as the correlation between Distraction and Joking, it was concluded that this first exploratory factor analysis was making fine

distinctions among three more basic and distinct constructs: Perspective-Taking Humor, Aggressive Humor, and Avoidant Humor. Thus, another principal-components exploratory factor analysis using an oblique rotation (Oblimin) was performed, only this time a three-factor model was specified. It was hypothesized that the three factors would represent the three distinct constructs of Perspective-Taking, Aggressive, and Avoidant Humor described above.

Items were considered to be part of a factor if they loaded highest on that particular factor and did not share loadings of >.2 with any other factor(s). As hypothesized, the first factor combined items from Perspective-Taking, Story-Telling, and Self-Deprecating Humor to form one Perspective-Taking Humor factor. The third factor combined all of the Distraction items and two items from the Joking factor. The factor describing Aggressive Humor, essentially remained the same. (See Table 4.)

Table 4: Interpretation of the Pattern Matrix Following Principal-Components Exploratory Factor Analysis with an Oblique Rotation - 3 Factors Specified (N= 281 males; 300 females)

ITEMS	COMPONENTS		
	1	2	3
Factor 1: Perspective Taking Humor			
19. It makes me feel better when I share stories about my past embarrassments	.75	--	--
22. I laugh to myself when I think of the embarrassing things I have done in the past.	.74	--	--
11. I feel better when people laugh at stories about my more embarrassing moments.	.73	.11	-.14
16. I laugh to myself about my past mistakes, even though I didn't think they were amusing at the time they happened	.72	--	--
6. I share stories about my more embarrassing moments to make people laugh	.71	--	--
18. I am able to see humor in events that I had once experienced as being quite distressing	.67	-.12	--
27. When others laugh in response to stories I tell about embarrassing experiences, I realize how silly it was to be upset about them in the first place.	.60	--	--
3. I tell funny stories about situations that have made me angry in the past	.54	--	.12
31. I privately make fun of myself when I make mistakes or do something embarrassing.	.50	--	.18

Factor 2: Aggressive Humor			
12. I privately make fun of people when I feel they are mistreating me	.10	**.80**	-.16
15. I privately make fun of people when they bother me	--	**.80**	--
30. I make fun of the irritating people in my life when I'm with my friends	--	**.76**	-.14
26. I respond to people who are insulting or rude to me by making fun of them in front of others	.12	**.74**	--
21. When someone is angry with me, I don't laugh out loud, but I privately make fun of their behaviour	--	**.64**	--
23. When someone makes fun of my short-comings, I will reply by poking fun at them.	--	**.64**	--
Factor 3: Avoidant Humor			
28. I try to make myself think of funny things when I find that my mind is filled with worrisome thoughts	--	--	**.81**
5. I change my moods at times of crisis by imagining funny things	--	-.12	**.81**
14. I try to find something to laugh at when I feel myself becoming upset	--	--	**.78**
2. I try to think of something amusing to distract myself from my own fears or worries	--	--	**.72**
10. I deal with people who are angry or upset with me by trying to make them laugh	.10	.15	**.47**
1. I tell jokes to make others laugh when I feel that a situation is getting too tense	.18	.17	**.43**

Note: 1. All factor loadings greater than .3 are written in bold.

2. Items 8, 25, 17, 4, 32, 24, 29, 20, 9, 13, & 7 did not load uniquely on any factor.

Table 5 presents the correlations among the unit-weighted factor scores of the 3-factor model of the WUHI.

Table 5: Correlations among unit-weighted factor scores of the 3-factor model of the WUHI (N= 581)

	Perspective-Taking Humor	Aggressive Humor	Avoidant Humor
Perspective-Taking	---		
Aggressive	.26***	---	
Avoidant	.51***	.27***	---

Note: ***p<.001

The factors representing Perspective-Taking Humor and Avoidant Humor were substantially correlated. However, the constructs they represent are conceptually distinct. Perspective-Taking Humor describes using adverse circumstances as content for humor whereas Avoidant Humor describes thinking of funny things in order to distract one's self and/or others from stressful thoughts and/or situations. Moreover, these ways of using humor may be associated with more or less favourable outcomes in response to stress. Thus, the two factors were not combined due to these theoretical considerations.

Exploration of Potential Sex-Differences in the Psychometric Properties of the WUHI

In order to investigate possible sex-differences in the factor structure of the WUHI, separate principal-components exploratory factor analyses using oblique rotations (Oblimin) were performed separately on the male and female data. Three factors were specified for extraction in both samples and the same inclusion criteria used for defining the factors among the entire sample were employed in these separate analyses for the two groups. As expected, the same factor structure was found for both sexes. (See Appendix D pp. 173-175 for a copy of both Pattern Matrices) .

In addition, the reliabilities of the unit-weighted composite scores for both sexes were similar (see Table 6 for reliabilities and means). However, sex-differences in the mean scores on Perspective-Taking Humor and Aggressive Humor were found; females scored significantly higher than males on Perspective-Taking Humor whereas males scored significantly higher than females on Aggressive Humor.

Table 6: Descriptive and reliability statistics for males and females on unit-weighted factor composite scores for the WUHI

	Alpha	N	X	SD	t
Perspective-Taking Humor					
Males	.81	276	27.70	5.86	
Females	.85	298	29.28	6.03	-3.17**
Aggressive Humor					
Males	.84	277	16.38	4.62	
Females	.86	299	15.34	4.73	2.65*
Avoidant Humor					
Males	.83	276	16.59	4.39	
Females	.79	299	16.56	3.90	.09

Note: *p<.05, **p<.01

Examination of the correlations among the composites in the male and female samples (see Table 6) indicated that the positive relationship between Aggressive Humor and Avoidant Humor was also significantly higher for males than for females [Fisher's Z = 3.02, p <.01]. No other sex-differences in the relationships between the factors were found.

Table 7: Correlations among composite factor scores of the 3-factor model of the WUHI among males and females separately.

	Perspective-Taking	Aggressive	Avoidant
Perspective-Taking	---	.34**	.54**
Aggressive	.23**	---	.39**
Avoidant	.49**	.16**	---

Note: 1. correlations for males are listed above the diagonal and the correlations for females are listed below the diagonal

2. **p< .001

Confirmatory Factor Analyses

In order to investigate the replicability of the three-factor model of the WUHI, a series of maximum-likelihood confirmatory factor analyses of this model were performed on a new data set collected from a third sample of Psychology 101 students (N=402; 174 males and 228 females) who completed the WUHI in mass testing during the winter term of 1998. This model was reasonably confirmed among this sample (GFI = .86, AGFI= .82).[1]

In order to test the equality of the fit of the three-factor model between males and females, a series of stacked confirmatory factor analyses with progressive equality constraints were performed (Joreskog & Sorbom, 1993). In stacked confirmatory factor analysis, the fit of a model is tested simultaneously in two samples. In contrast to performing confirmatory factor analyses among males and females separately, simultaneous testing of models with progressive constraints, which specify the aspects of the model that must be equal in both samples, allows one to more precisely determine how the model may differ between them. The result of these analyses indicated that there were no significant, systematic differences in the fit of the three-factor model between the sexes (see Table 7). Constraining the error variances along with the factor loadings to equality between groups led to a significant increase in the chi-square. This indicated that the error variances for the items may have differed at least slightly between the sexes. However, inspection of the pattern of error variances in both groups revealed no systematic differences between them.

[1] GFI = Goodness of Fit Index; AGFI = Adjusted Goodness of Fit Index

Table 8: Stacked CFAs Testing Sex-Differences in the Fit of the 3-Factor Model of the WUHI

Model	X^2	df	GFI	AFI	ΔX^2	Δdf
1. No Equality Constraints b/w the Sexes	737.57	334	.831	.787		
2. Factor Loadings Constrained to be Equal b/w the Sexes	762.21	351	.826	.791	24.64	17
3. Factor Loadings, & Error Variances Constrained to be Equal b/w the Sexes	796.55	371	.819	.795	34.34	20*
4. Factor Loadings, Error Variances, & Inter-factor Correlations Constrained to be Equal b/w the Sexes	804.26	377	.816	.796	7.29	6

Note: 1. The table lists the results of statistical tests comparing the fit of the model to the one listed previously.

2. A significant p value indicates a significant lack of fit.

3. *p<.05

Other models specifying 6- and 4-factors were also tested using maximum-likelihood confirmatory factor analyses. Because neither of these models nor the 3-factor model are nested, their fit indices cannot be directly compared statistically in order to determine which model best fits the data. However, estimates of the inter-factor correlations resulting from the analysis performed to test the 6-factor model reported earlier, supported inferences regarding the advantages of representing the data with three, rather than six factors. For the 6-factor model, the confirmatory factor analysis estimated the correlations between Perspective-Taking, Humorous Story-Telling, and Self-Deprecating Humor to be very high (r's ranging from .75 to .80), as was that between

Distraction and Joking (r =.67). The 4-factor model showed similar problems in distinguishing between Distraction and Joking (r = .67).

DISCUSSION

This study provides evidence which supports the meaningfulness of the factor structure of the WUHI and the reliability of the WUHI subscale scores among males and females. Results from a series of exploratory factor analyses indicate that the items of the WUHI are well-represented by a three-factor model consisting of Perspective-Taking Humor, Aggressive Humor, and Avoidant Humor. In addition to verifying hypotheses regarding the underlying factor structure of the WUHI, the results of confirmatory factor analyses performed on another sample indicate that the three-factor model is replicable and that there are no significant differences in the fit of the model between the sexes. Unit-weighted composite scores for each of the three factors were also found to be equally reliable for males and females.

Although this study does not address issues about the validity of the WUHI as a measure of coping humor, the mean differences found between males and females on factors describing Perspective-Taking Humor and Aggressive Humor are suggestive. The fact that females reported using Perspective-Taking Humor more than males might indicate that laughing at one's self and viewing distressing events from a humorous perspective is more characteristic of how females use humor to cope than it is for males. The fact that many of the items in this factor describe feeling better after sharing one's humorous perspective and obtaining positive feedback from others suggest that females are more likely than males to use this type of humor in order to gain social support. In contrast to females, males' higher scores on Aggressive Humor suggest that they are more likely to use humor to disparage others, possibly as a way of asserting their superiority and repairing their status while under stress. That the relationship between Aggressive Humor and Avoidant Humor was stronger for males than for females indicates that the type of humor males use in order to distract themselves

or avoid anxiety-provoking thoughts and situations may be more aggressive than that used by females.

STUDY 2

The purpose of Study 2 was to investigate the validity of the WUHI subscales by examining their relationships to existing, self-report measures of coping and personality. First, convergent validity of the WUHI scales was assessed by their relationship with the CHS. Subsequently, each of the WUHI subscales, the CHS and the SHRQ were examined in relation to the Five Factor Model of Personality (i.e., The Big Five; Costa & McCrae, 1985) and a measure of dispositional coping styles (The COPE; Carver, Scheier, & Weintraub, 1989). In addition to investigating their convergent and discriminant validity, it was hoped that investigation of the relationships of the humor scales to measures of personality and coping would increase our understanding of differences among various ways of using humor to cope. Sex-differences in the relationships of the humor measures to those of personality and coping were also explored.

The relationship of the WUHI to existing measures of coping humor

The CHS assesses the extent to which individuals use humor to cope with stress, and is one of the most widely used self-report measures in the study of the stress-moderating role of humor. Given the similar focus on humor as a coping strategy, it was expected that the WUHI subscales would be significantly correlated with the CHS. However, in light of previous research suggesting that male humor is more aggressive than female humor (e.g., Groch, 1974; McGhee, 1976), it was expected that the relationship between the WUHI Aggressive Humor subscale and the CHS would be stronger for males than for females.

Personality, Coping, and Humor

In the last 15 years, the five-factor model of personality, which was derived from extensive factor analytic study of trait measures, has become a predominant model of personality structure (O'Brien & De Longis, 1996; Watson & Hubbard, 1996). The five 'super traits' (Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness; Costa & McCrae, 1985) that have emerged from these investigations measure dimensions of personality that are largely distinct from each other. Neuroticism describes the tendency to experience negative affect (e.g., sadness, hostility, and anxiety) and emotional instability. It has proven to be a strong and unique predictor of negative affect and psychopathology, and to be largely unrelated to measures of positive affect and well-being (Costa & McCrae, 1980; Meyer & Shack, 1989; Watson & Clark, 1992; Watson, Clark, McIntyre, & Hamaker, 1992). In contrast to Neuroticism, Extraversion involves the tendency to experience positive emotions. Extraverted individuals seem to be cheerful, fun-loving, outgoing, assertive, enthusiastic, and adventurous (Costa & McCrae, 1980; Costa & McCrae, 1992; McCrae & Costa, 1986). A number of studies have found that Extraversion is indeed a strong and unique predictor of positive affect and is a poor predictor of negative affect and psychopathology. Openness to Experience is defined by the inclination to be curious, creative, and flexible, and to have broad interests and unconventional values (McCrae, 1992; McCrae, 1993-1994; McCrae & Costa, 1987). Agreeableness refers to the tendency to be friendly, good-natured, courteous and trusting; and Conscientiousness is defined by the tendency to be careful, reliable, hard-working, and well-organized (Costa & McCrae, 1992; McCrae & Costa, 1987). The correlates of these five personality dimensions have been widely researched (Watson & Hubbard, 1996). The relative lack of redundancy among these five dimensions, combined with the extensive literature on the correlates of these traits, makes the

five-factor model of personality an efficient means for evaluating the distinction between measures of the use of humor for coping, and provides a foundation for hypothesis generation regarding the predictive validity of these measures.

Most of the research on the relationship between the five-factor model of personality and coping has focused on Neuroticism and Extraversion (O'Brien & DeLongis, 1996). Consistent with the established relationship between Neuroticism and psychopathology, a number of studies have shown that individuals high in Neuroticism are most likely to rely on forms of emotion-focused coping such as avoidance and self-blame which are often associated with poor outcomes; they are less likely to engage in problem-focused coping (Endler & Parker, 1990; O'Brien & DeLongis, 1996; Watson & Hubbard, 1996). On the other hand, Extraversion is associated with coping strategies that are often associated with favourable outcomes. In contrast to Neuroticism, both problem-focused coping and emotion-focused coping strategies are associated with Extraversion, the latter involving the use of social support and positive reframing (McCrae & Costa, 1986; Watson & Hubbard, 1996).

There has been some research linking Neuroticism and Extraversion to humor. Not surprisingly, these studies have found negligible or weak negative correlations between measures of humor and Neuroticism, but have found Extraversion to be a significant positive predictor of a number of aspects of humor. Ruch & Deckers (1993), found the SHRQ to be positively related to Extraversion in a sample of 165 German ($r = .52$) and 118 American ($r = .36$) university students. Ruch (1994), who conducted a factor analytic study of measures of humor and temperament in a sample of 159 German adults, found that the CHS and the SHRQ loaded highly on Extraversion and were essentially unrelated to Neuroticism. Extraversion has also been found to be positively associated with wittiness as assessed by self-reports

(McCrae, et al., 1986), as well as by objective measures of humor creation (Ruch, & Kohler, 1998).

Two other personality factors that are likely to be relevant to the use of humor for coping are Openness to Experience and Agreeableness. Given their proclivity for creative and unconventional thinking, one would expect individuals high in Openness to Experience to be inclined to perceive and use adversity as content for humor. Indeed, those characterized as Open to Experience have been found to be more competent in creating humor (Ruch & Kohler, 1998) and to be more inclined to use humor to cope than those lower in this trait (McCrae & Costa, 1986). The few studies that have investigated the relationship between Agreeableness and coping have consistently found that individuals high in this trait are more likely to seek social support in response to stress than their less agreeable counterparts (O'Brien & DeLongis, 1996; Watson & Hubbard, 1996). There has been little examination of the relationship between Agreeableness and humor. Ruch & Kohler (1998) who examined performance on a humor creativity task in the context of the five-factor model of personality did not find Agreeableness to be a significant predictor of the number, wittiness or originality of participants' humorous responses. However, while Agreeableness may not be a significant predictor of humor competency, it may be important for predicting the style of humor individuals are likely to adopt. As noted by Martin (1998), Agreeableness may be potentially important for distinguishing those with a preference for hostile humor from those whose humorous style is more likely to be benevolent and good-natured.

Personality profiles associated with different ways of using humor to cope

Of the WUHI subscales, the Perspective-Taking Humor scale best captures the type of humor often assumed to be beneficial for coping with stress. Perspective-taking humor as a general construct refers to the ability to perceive humor in events that threaten one's sense of well-being. This not only involves the ability to appreciate absurdity in potentially stressful life events, but also the ability to find humor in one's own short-comings. The Perspective-Taking Humor scale of the WUHI, in addition to assessing the ability to appreciate humor in adversity, emphasizes the creation and sharing of perspective-taking humor with others as a means of coping with stressful events. This definition suggests that individuals who use perspective-taking humor to cope are likely cheerful, flexible in cognitive style, seeing situations from numerous vantage points, and friendly. In other words, individuals who obtain high scores on the Perspective-Taking Humor scale would be expected to be high in Extraversion, Openness to Experience, and Agreeableness. In so far as they measure perspective-taking humor, the CHS and the SHRQ, which were designed to assess humor's potentially health-enhancing properties, should be associated with a similar personality profile, although to a lesser degree given that the WUHI is specifically designed to measure perspective-taking humor.

The Aggressive Humor scale of the WUHI describes the use of hostile humor to attack and disparage others as a means of coping with interpersonal and self-esteem challenging stresses. Individuals who obtain high scores on this scale are likely to be perceived by others as witty, but not particularly friendly or cheerful. Thus, while they may obtain high scores on Openness to Experience because of unique and witty joking, the preference for hostile humor would be expected to be associated with high scores on Neuroticism and low scores on Agreeableness.

The Avoidant Humor scale of the WUHI describes using humor in order to distract one's self and others when confronted with anxiety-provoking thoughts or situations. Similar to the Perspective-Taking Humor scale, the coping strategy described by Avoidant Humor likely allows the individual to obtain psychological distance during a stressful event. However, rather than taking an alternate and humorous perspective of reality, high scores on Avoidant Humor indicate a tendency to use humor in order to escape from that reality. As with other forms of emotion-focused coping, avoidant humor is likely to be of greatest benefit in situations that are beyond one's control; it is less likely to be beneficial in situations where action is required in order to alter the stressful situation. It was therefore expected that the Avoidant Humor scale would be associated with a mixed personality profile. Individuals who report high use of this coping strategy would be expected to have a fairly low tolerance for stress. Their frequent use of humor in order to avoid reality suggests that such individuals feel incapable of directly confronting and trying to actively solve their problems. Hence, high scores on Avoidant Humor would also be expected to be positively associated with Neuroticism. Given its focus on attempts to make one's self and others laugh during a stressor, and the recognition of the potential benefits of this strategy, it was expected that scores on Avoidant Humor would also be positively associated with Extraversion.

Dispositional Coping Styles associated with different ways of using humor to cope.

In addition to evaluating the validity of the humor scales in their relation to the five-factor model of personality, the relationships of the WUHI, CHS and the SHRQ to a measure of specific dispositional coping styles were also examined. The COPE (Carver, Scheier, & Weintraub, 1989), which samples a wide range of coping styles, was chosen as the

measure with which to investigate these relationships. The 15 COPE subscales assess the extent to which individuals typically engage in a wide range of conceptually distinct coping styles. These include problem-focused strategies (e.g., active-coping, planning, suppression of competing activities), restraining one's self from acting too soon, the seeking of social support for both instrumental and emotional purposes, using humor, positive reframing of the event, accepting, turning to religion, focusing on and venting of emotions, and various forms of avoidance (e.g., denial, alcohol and drug use, mental disengagement, behavioural disengagement).

The WUHI, SHRQ, and CHS were each expected to be positively associated with reports of "using humor" on the COPE. However, Perspective-Taking Humor was specifically expected to be related to Positive Reinterpretation and Growth, which essentially assesses the extent to which individuals try to see events from a positive perspective and to learn from them. Another unique emphasis of the Perspective-Taking Humor scale involving humorous story-telling about past stressful events suggests that this humor measure would be positively correlated to reports of emotional support seeking on the COPE. Similar relationships to Emotional Social Support were not expected for the CHS or the SHRQ, as neither specifically assesses the tendency to share humorous perspectives with others. Aggressive Humor, which involves attacks upon others, was expected to be positively related to Focus on and Venting of Emotions, and to be negatively related to Restraint. It was also hypothesized that the expected positive relationship between the Aggressive Humor scale and Humor on the COPE would be stronger for males than for females. Finally, Avoidant Humor was expected to be positively related to other avoidant coping styles such as Mental Disengagement (i.e., doing things to prevent one's self from thinking about the stressor), and Denial. Given the assumption that individuals who endorse high use of Avoidant Humor are likely to be uncomfortable

with conflict, high scores on this scale may also be positively related to Restraint.

METHOD

Participants

The WUHI and the CHS were completed as part of mass testing by three samples of Psychology 101 students at the University of Waterloo during the spring term of 1997 (N=194), and the winter (N=387) and spring terms (N= 145) of 1998, resulting in a total sample of 368 males and 358 females. A subset of participants who completed mass testing in the winter and spring of 1998, were randomly selected, contacted by phone and asked if they would be interested in taking part in a study on personality. Once in the lab, this subset of participants (N = 198; 96 males and 102 females) completed the other humor, personality, and coping questionnaires in groups of various sizes. All participants received course credit for taking part in the study.

Questionnaire Measures

1. Waterloo Uses of Humor Inventory (WUHI): (please see Study 1 for a full description of the WUHI scales and their psychometric properties; see Appendix __ for a copy of the WUHI).

2. Coping Humor Scale (CHS; Martin & Lefcourt, 1983). The CHS is a 7-item, self-report scale that assesses the extent to which individuals report using humor to cope with stress. Respondents use a 4-point scale to rate the extent to which they agree with statements like "I usually look for something comical to say when I am in a tense situation", with response options ranging from "strongly disagree" (1) to "strongly agree" (4). The typical mean is 20, with a SD of about 3.5 and has been found to have adequate internal consistency reliability (Cronbach alphas ranging between .6 and .7). (See Appendix E, pp. 176 for a copy of this scale).

3. Situational Humor Response Questionnaire (SHRQ; Martin & Lefcourt, 1984). The SHRQ is a 21-item scale; the first 18 items describe situations that vary in their potential for eliciting mirth. Participants are asked to rate, on a 5-point scale, the degree to which they responded, or would respond with mirth to each of the situations (e.g., "If you were eating in a restaurant with some friends and the waiter accidentally spilled a drink on you"). Response options range from "I would not be particularly amused"(1) to "I would have laughed heartily"(5). The last three items of the scale ask the respondents to rate self-descriptive statements regarding their humor tendencies. The typical mean is a score of 60, with a SD of about 9, and it has been found to have adequate internal consistency reliability (Cronbach alphas ranging from .7 to .79). (See Appendix E, pp. 177 for a copy of this scale).

4. NEO-Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992). The NEO-FFI is a short version of the revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992). It contains 5 12-item scales measuring each of the 5 factors: Neuroticism (N), Extraversion (E), Openness to Experience (O), Conscientiousness (C), and Agreeableness (A). Items are rated on a 5-point scale, response options ranging from "strongly disagree" to "strongly agree". The NEO-FFI shows good convergent validity with the NEO-PI-R (convergent r's ranging from .77-.94) and coefficient alphas for the scales range from .78 to .87, with a median alpha of .8 (Costa & McCrae, 1992) (see Appendix E, pp. 183 for a copy of sample NEO-FFI items).

5. The COPE (Carver, Scheier, & Weintraub, 1989). The COPE contains 15 4-item scales measuring a diverse array of coping styles. Examples include: Active Coping, Denial, Venting of Emotions, and Humor. Participants were given the dispositional version of the COPE,

which asks respondents to describe what they usually do under stress on a 4-point scale, ranging from "I usually don't do this at all" (1) to "I usually do this a lot". Internal consistency reliabilities for each of the factors range from Cronbach alphas of .45 to .92, with a median value of .71 (Carver, Scheier, & Weintraub, 1989). (See Appendix E, pp. 184 for a list of sample items).

6. The Impression Management Scale (IM) of the Balanced Inventory of Desirable Responding (BIDR; Paulhus, 1988). Social desirability bias has often been regarded as problematic in humor research (Allport, 1961). Hence, the IM scale of the BIDR was used to assess whether responses to some scales of the WUHI reflect a desire for individuals to present themselves in a positive light (i.e., over-report positive behaviours and under-report negative behaviours). This scale was also included in order to control for social desirability bias while investigating relationships between the self-report measures. This subscale has been found to have high internal consistency (alphas range from .75 to .86) and adequate test-retest reliability (a test-retest correlation over 5-weeks of .65). It has also demonstrated convergent validity with other well-known impression management scales such as that on the MMPI (Paulhus, 1991). (See Appendix E, pp. 186 for a copy of this scale).

RESULTS & DISCUSSION

Descriptive Univariate and Bivariate Analyses

Humor Measures. The means and standard deviations of each of the WUHI subscales in the lab subsample were consistent with those found among the larger, mass testing sample. The magnitudes of intercorrelations between WUHI subscales among males and females were also consistent with those found in the larger mass testing sample. However, sex-differences in the mean scores on the Perspective-Taking Humor and Aggressive Humor scales found in the large mass testing sample were not replicated in the smaller subsample of participants who completed the full battery of questionnaires in the lab (See Tables 8&9). The means and standard deviations of the CHS and the SHRQ were consistent with those reported in the literature and did not differ between the sexes. As in previous studies, the CHS and SHRQ were moderately correlated [$r = .46$, $p < .001$].

NEO-FFI. Consistent with previous findings, females in this sample were found to score significantly higher than males on Agreeableness (Costa & McCrae, 1992). In contrast to the results of previous studies (Costa & McCrae, 1992), female participants also scored significantly higher than males on Extraversion and Conscientiousness and did not score higher than males on Neuroticism. Consistent with other research conducted with this inventory, the five personality factors demonstrated low to moderate intercorrelations (Costa & McCrae, 1992; O'Brien & DeLongis,1996).

Table 9: Descriptives within mass-testing sample

Measure		N	Mean	SD	t
CHS	Males	368	19.54	3.38	
	Females	358	19.22	3.66	1.2
WUHI:					
Perspective-Taking Humor	Males	368	27.22	6.16	
	Females	356	29.25	6.00	-4.49***
Aggressive Humor	Males	368	16.40	4.59	
	Females	357	15.31	4.67	3.16**
Avoidant Humor	Males	368	16.40	4.26	
	Females	357	16.47	3.86	-.23

Note: **p<.01, ***p<.001

Table 10: Descriptives within lab sample

Measure		N	Mean	SD	t
CHS	Males	94	19.35	3.40	
	Females	101	19.07	3.59	.56
SHRQ	Males	95	60.99	9.70	
	Females	102	62.70	9.19	-1.27
WUHI:					
Perspective-Taking Humor	Males	89	28.17	5.43	
	Females	86	29.49	5.52	-1.59
Aggressive Humor	Males	90	16.42	4.43	
	Females	86	15.48	5.02	1.33
Avoidant Humor	Males	89	16.78	4.28	
	Females	86	16.87	3.93	-.16
NEO-FFI:					
Neuroticism	Males	96	33.03	9.04	
	Females	102	33.28	8.80	-.59
Extraversion	Males	96	39.70	6.51	
	Females	102	43.48	6.87	-3.98**

Measure		N	Mean	SD	t
Openness to Experience	Males	96	42.35	7.42	
	Females	102	42.80	6.90	-.44
Agreeableness	Males	96	40.94	6.62	
	Females	102	45.44	6.09	-4.98**
Conscientiousness	Males	95	41.95	6.22	
	Females	102	43.83	5.74	-2.21*
COPE SCALES:					
Active Coping	Males	96	11.46	2.29	
	Females	102	10.91	2.19	1.72
Planning	Males	96	11.60	2.83	
	Females	102	11.78	2.50	-.47
Suppression of Competing Activities	Males	96	9.84	2.30	
	Females	102	9.33	1.95	1.69
Restraint Coping	Males	96	9.52	2.14	
	Females	102	9.39	2.18	.42
Instrumental Social Support	Males	96	10.74	3.12	
	Females	102	12.15	2.60	-3.46**
Emotional Social Support	Males	96	9.83	3.36	
	Females	102	12.47	3.04	-5.80**
Positive Reinterpretation & Growth	Males	96	11.90	2.31	
	Females	102	12.36	2.21	-1.45
Acceptance	Males	96	12.06	2.41	
	Females	102	11.77	2.09	.93
Turning to Religion	Males	96	6.87	3.56	
	Females	102	8.65	4.09	-3.28**
Venting	Males	96	9.42	3.09	
	Females	102	10.94	3.21	-3.40**

Measure		N	Mean	SD	t
Denial	Males	96	5.98	2.33	
	Females	102	6.13	2.14	-.47
Behavioural Disengagement	Males	96	6.90	2.46	
	Females	102	6.06	1.85	2.71**
Mental Disengagement	Males	96	10.06	2.58	
	Females	102	10.03	2.39	.09
Alcohol & Drug Use	Males	96	5.82	3.31	
	Females	102	5.03	2.22	1.97
Humor	Males	96	10.01	3.29	
	Females	102	9.74	3.36	.58

Note: *p<.05, **p<.01

COPE. The means and standard deviations for the majority of the subscales were consistent with those reported by the authors of the scale. The only exception was Alcohol and Drug Use; respondents in this study reported greater use of alcohol and drugs in response to stress than the college sample reported by the authors of the scale ($M = 1.38$, $SD = .78$ in Carver, Scheier and Weintraub, 1989). Consistent with Carver et al. (1989), females scored significantly higher than males on Instrumental Social Support, Emotional Social Support, and Venting, and males scored significantly higher than females on Behavioural Disengagement. Unique to this sample was the greater extent to which females, in comparison to males, reported relying on religion in response to stress. As reported by Carver et al. (1989), most of the subscales demonstrated weak to moderate correlations with each other. The exceptions were the relationship found between Active Coping and Planning [$r = .66$, $p<.01$], Emotional Social Support and Instrumental Social Support [$r = .74$, $p<.01$], and Emotional Social Support and Venting [$r = .59$, $p<.01$].

BIDR-IM. No significant sex-differences in mean responses to this scale were found, indicating that males and females in this study did not differ

with regard to impression management. In addition, the BIDR-IM was essentially unrelated to the WUHI scales for both sexes [all r's < -.01]. The BIDR-IM was significantly related to certain COPE and NEO-FFI scales. Those who engaged in the most impression management were less likely to report seeking Emotional Social Support [r = -.20, p <.05] in response to stress, and were less likely to acknowledge a tendency to Focus on and Vent Emotion [r = -.15, p<.05] and engage in Denial [r = -.17, p<.05]. Sex-differences were found in the relationship of the BIDR-IM to Extraversion and Conscientiousness. Males with higher BIDR-IM scores were more likely to obtain lower scores on Extraversion than males less concerned with impression management [r = -.20, p < .05]; these variables were positively but not significantly related among females [r = .09, n.s.; Fisher's Z = 2.02, p<.05]. Females who obtained higher scores on the BIDR-IM were also more likely than those with lower scores and males to report higher Conscientiousness [female r = .27, p < .01; male r = -.10, n.s.; Fisher's Z = 2.55, p<.05]].

Evaluating the validity of the WUHI in relation to the CHS

Evaluation of the validity of the WUHI scales was accomplished by correlating the WUHI with the CHS in the large mass testing samples collected over three academic terms (See Table 11). All of the WUHI scales correlated significantly and positively with the CHS within the total sample, although the relationship between the CHS and Aggressive Humor was significantly weaker than that obtained between the CHS and the other WUHI scales [e.g., CHS & Perspective-Taking Humor vs. CHS & Aggressive Humor, t(715) = 8.87, p<.001]. In addition, a separate examination of these relationships among males and females indicated that, among males, the CHS was positively related to all of the WUHI scales; among females, positive relationships between each of the WUHI scales and the CHS were found for all but Aggressive Humor (See Table 12). Comparison of the magnitude of the correlation of Aggressive

Humor with the CHS between males and females indicated that the relationship between these two humor measures was significantly stronger for males than it was for females [Fisher's Z = 2.12, p<.05].

Table 11: Correlations between the CHS and WUHI scales

	CHS	Perspective-Taking	Aggressive	Avoidant
CHS	--			
Perspective-Taking	.44*** (n= 718)	--		
Aggressive	.14*** (n=720)	.28*** (n = 722)	--	
Avoidant	.55*** (n= 719)	.50*** (n= 722)	.26*** (n= 723)	--

Note: ***p<.001

Table 12: Correlations between the CHS and WUHI scales among males and females, separately.

	CHS	Perspective-Taking	Aggressive	Avoidant
CHS	--	.45*** (n=363)	.21*** (n = 364)	.58*** (n = 363)
Perspective-Taking	.46*** (n=355)	--	.33*** (n=366)	.51*** (n = 366)
Aggressive	.06 (n=356)	.28*** (n=356)	--	.34*** (n= 366)
Avoidant	.54*** (n=356)	.50*** (n=356)	.18** (n=357)	--

Notes: 1. Correlations for males are listed above the diagonal and the correlations for females are listed below the diagonal

2. ***p<.001, **p<.01

Conclusions

Perspective -Taking Humor and Avoidant Humor demonstrated convergent validity with the CHS for both sexes, suggesting that these WUHI scales describe ways in which both males and females use humor to cope. As expected, Aggressive Humor was more strongly related to the CHS for males than for females. That Aggressive Humor was negligibly related to the CHS for females suggests that disparaging others when threatened may not be typical of the way females use humor to cope. Moreover, the fact that ratings on Aggressive Humor were negligibly related to scores on the BIDR-IM among the subsample of females who completed this measure in the lab suggests that this pattern of results is not likely accounted for by social desirability. In contrast to females, Aggressive Humor was significantly and positively related to the CHS among males, suggesting that disparaging others is more characteristic of the way males use humor to cope with stress than it is for females. However, the magnitude of the relationship even among males was not high indicating that aggressive humor is of limited importance to understanding male coping humor.

Examination of the WUHI, CHS and the SHRQ in the context of the Five-Factor Model of Personality

Table 13 presents Pearson correlations between the humor scales and the Big Five personality traits among the entire sample and among males and females, separately.

WUHI Perspective-Taking Humor. Examination of the relationship of Perspective-Taking Humor to the Big Five personality traits among the entire sample indicated a significant positive relationship between this humor measure and Extraversion. Counter to expectation, Perspective-Taking Humor was not a significant positive predictor of Openness to Experience or Agreeableness among the entire sample. However,

inspection of the correlations among males and females separately, indicated significant sex-differences in the relationship of the

Table 13: Correlations between measures of humor and the Big Five personality traits.

	Perspective-Taking Humor	Aggressive Humor	Avoidant Humor	CHS	SHRQ
N Total (n)	.04 (175)	.06 (176)	.07 (175)	-.23** (195)	-.21** (197)
Males (n)	.16 (89)	.10 (90)	.24* (89)	-.05 (94)	-.18 (95)
Females(n)	-.09 (86)	.02 (86)	-.12 (86)	-.38** (101)	-.25* (102)
E Total (n)	.21** (175)	-.03 (176)	.22** (175)	.25** (195)	.49** (197)
Males (n)	.06 (89)	.05 (90)	.20 (89)	.23* (94)	.49** (95)
Females(n)	.30** (86)	-.05 (86)	.25* (86)	.30** (101)	.48** (102)
O Total (n)	.12 (175)	-.05 (176)	.01 (175)	.03 (195)	.10 (197)
Males (n)	-.05 (89)	-.01 (90)	-.20 (89)	-.08 (94)	-.03 (95)
Females(n)	.26* (86)	-.07 (86)	.22* (86)	.14 (101)	.23* (102)
A Total (n)	-.01 (175)	-.33**(176)	-.02 (175)	.10 (195)	.15* (196)
Males (n)	-.22* (89)	-.36** (90)	-.06 (89)	.08 (94)	.08 (94)
Females(n)	.13 (86)	-.27* (86)	.02 (86)	.17 (101)	.17 (102)
C Total (n)	.02 (175)	-.15 (175)	.06 (174)	-.01 (194)	.02 (196)
Males (n)	-.08 (88)	-.20 (89)	.06 (88)	-.05 (93)	.10 (94)
Females(n)	.09 (86)	-.07 (86)	.06 (86)	.04 (101)	--- (102)

Note: 1. N= Neuroticism, E = Extraversion, O = Openness to Experience, A = Agreeableness C = Conscientiousness

2. *p<.05, **p <.01

Perspective-Taking Humor scale to each of these traits. Perspective-Taking Humor was a positive predictor of Openness to Experience among females, but was negligibly related to this trait among males [Fisher's Z = -2.04 p<.05]. For Agreeableness, Perspective-Taking Humor did not predict females' ratings, but was a negative predictor of males' ratings on this trait, indicating that males who reported using

Perspective-Taking Humor most often were likely to describe themselves as being the least courteous and friendly [Fisher's Z = -2.29, p<.05].

WUHI Aggressive Humor. As expected, Aggressive Humor was significantly negatively related to Agreeableness. This relationship indicated that individuals who score higher on Aggressive Humor rate themselves as being less friendly and courteous. Contrary to expectation, Aggressive Humor was not a significant predictor of Neuroticism.

WUHI Avoidant Humor. As predicted, Avoidant Humor was significantly positively associated with both Extraversion and Neuroticism. However, the significant positive relationship between Avoidant Humor and Neuroticism was found only among males, and the difference in the magnitude of this relationship between the sexes was significant [Fisher's Z = 2.36, p<.05]. Significant sex differences were also found in the prediction of Openness to Experience; Avoidant Humor was a significant positive predictor of Openness to Experience for females but a negative predictor of this trait for males [Fisher's Z = -2.76, p<.01]

CHS. Consistent with previous findings, the CHS demonstrated significant relationships to Neuroticism and Extraversion, indicating that the higher an individual's score on the CHS, the lower he/she scored on Neuroticism and the higher he/she scored on Extraversion. However, the negative relationship between the CHS and Neuroticism was significantly stronger among females than it was among males [Fisher's Z = -2.48, p<.05]. Contrary to expectation, the CHS was not significantly related to either Openness to Experience or Agreeableness.

SHRQ. Similar to the CHS, the SHRQ was a significant predictor of Neuroticism and Extraversion; higher scores on this humor measure were related to lower scores on Neuroticism and higher scores on Extraversion. Also like the CHS, the SHRQ was not a significant predictor of Openness to Experience. The SHRQ was significantly positively related to this trait among females. However, the apparent difference in the relationship of the SHRQ to this personality trait was not significant. In contrast to the CHS, the SHRQ was a significant positive predictor of Agreeableness.

Conclusions

The personality profile characterized by higher scores on Extraversion, Openness to Experience, and Agreeableness that was expected to be positively associated with Perspective-Taking Humor was not found. Although the WUHI Perspective-Taking Humor scale was a significant predictor of all three of these personality traits, sex-differences in the relationship of it to Extraversion, Openness, and Agreeableness suggest that the validity of this measure may be limited to females. Among females, the Perspective-Taking Humor scale was significantly positively related to both Extraversion and Openness, but was not significantly related to Agreeableness. Thus, while evidence supporting the conceptualization of Perspective-Taking Humor as measuring a benevolent and friendly humorous style was not clearly confirmed, females' reports on this measure do appear to capture both the affective and cognitive traits that are thought to be essential to using humor for coping with stress. In contrast to the results found among females, males' reports on the Perspective-Taking Humor scale were positively related to Extraversion, essentially unrelated to Openness, and negatively related to Agreeableness. The very weak relationship between males' scores on Perspective-Taking Humor and Openness suggests that this humor measure may not be a strong predictor of males'

ability to adopt a humorous perspective and to create humor from adverse experiences. Moreover, the fact that males who obtained higher scores on the Perspective-Taking Humor scale described themselves as less friendly and good-natured certainly suggests that, among males, this humor measure is not likely to predict the benevolent, interpersonally warm style of humor it was designed to assess.

Although also intended as measures of perspective-taking humor, the pattern of relationships found with the CHS and the SHRQ in relation to the five–factor model of personality were not consistent with hypotheses and also differed from that obtained with the WUHI Perspective-Taking Humor scale. Consistent with the results of previous studies reported in the literature, both of these measures were positively related to Extraversion, and negatively related to Neuroticism. The SHRQ demonstrated the expected positive relationship with Agreeableness. However, neither the CHS nor the SHRQ were significant predictors of Openness to Experience. Hence, it would appear that the SHRQ is a strong indicator of positive affect, assertiveness, and an appreciation of perspective-taking humor, it may not be a strong indicator of the ability to create this kind of humor as a means of coping with adversity. The profile associated with the CHS indicates that it too is a strong predictor of positive affect, but counter to expectation, high scores on this measures do not appear to be indicative of the cognitive and stylistic qualities thought to be characteristic of individuals who engage in perspective-taking humor.

Distinct from the other humor measures, the WUHI Aggressive Humor scale was the only one that demonstrated a significant negative relationship with Agreeableness for both sexes. This relationship indicated that males and females who reported being friendly, warm and courteous were least likely to report using humor to attack others in response to stress. The Aggressive Humor scale was also the only humor measure that failed to demonstrate significant relationships with either

Extraversion or Neuroticism. This suggests that, while Aggressive Humor may be a valid predictor of an individual's humor style, it may not be a strong predictor of outcomes in response to stress.

The personality profiles found to be associated with the WUHI Avoidant Humor scale differed significantly between the sexes. Among females, the personality profile found to be associated with the Avoidant Humor scale was similar to that found with Perspective-Taking Humor. Both of these WUHI scales were positively related to females' scores on Extraversion and Openness to Experience. In contrast to females, the personality profile associated with males' Avoidant Humor scores was distinct from that found with the other humor scales, and was suggestive of negative outcomes in response to stress. Although significantly and positively associated with Extraversion, males' Avoidant Humor scores were also significant positive predictors of Neuroticism. This suggests that joking and/or thinking of funny things in order to distract one's self and others from anxiety provoking thoughts and situations may have limited benefits for males. Moreover, the significant negative association between males scores on Avoidant Humor and Openness to Experience suggests that these individuals may be more inclined to communicate or think of humor created by others, rather than to create novel humor from aspects of their own experience.

Examination of the validity of the WUHI, CHS and the SHRQ in relation to other dispositional coping styles

Pearson correlations were performed to examine the relationship of each of the humor measures to other specific coping styles. Table 14 presents the results of these analyses performed among the total sample, and separately for each sex.

Table 14: Correlations between measures of humor and the COPE scales

	Perspective-Taking Humor	Aggressive Humor	Avoidant Humor	CHS	SHRQ
Active Coping					
Total (n)	-.09 (175)	-.05 (176)	.08 (175)	.10 (195)	.14 (197)
Males (n)	-.28**(89)	-.11 (90)	.03 (89)	.03 (94)	.11 (95)
Females (n)	.15 (86)	-.01 (86)	.14 (86)	.16 (101)	.19 (102)
Planning					
Total (n)	-.05 (175)	-.04 (176)	-.02 (175)	.06 (195)	.15* (197)
Males (n)	-.19 (89)	-.16 (90)	-.07 (89)	-.02 (94)	.11 (95)
Females (n)	.10 (86)	.11 (86)	.04 (86)	.15 (101)	18 (102)
Suppression of Competing Activities					
Total (n)	-.09 (175)	-.08 (176)	.06 (175)	.09 (195)	.06 (197)
Males (n)	-.06 (89)	.01 (90)	.11 (89)	.08 (94)	.12 (95)
Females (n)	-.10 (86)	-.22* (86)	.01 (86)	.10 (101)	01 (102)
Restraint Coping					
Total (n)	-.09 (175)	-.17* (176)	.17* (175)	.06 (195)	.02 (197)
Males (n)	-.10 (89)	-.19 (90)	.25* (89)	.06 (94)	.03 (95)
Females (n)	-.08 (86)	-.15 (86)	.10 (86)	.06 (101)	02 (102)
Instrumental Social Support					
Total (n)	.16* (175)	-.02 (176)	.14 (175)	.01 (195)	.16* (197)
Males (n)	.02 (89)	-.03 (90)	.19 (89)	.09 (94)	.17 (95)
Females (n)	.28**(86)	.03 (86)	.08 (86)	-.06 (101)	.11 (102)
Emotional Social Support					
Total (n)	.28***(175)	.04 (176)	.19* (175)	.02 (195)	.23**(197)
Males (n)	.22* (89)	.01 (90)	.28**(89)	.12 (94)	.34** (95)
Females (n)	.29**(86)	.16 (86)	.10 (86)	-.04 (101)	.08 (102)
Positive Reinterpretation					
Total (n)	.10 (175)	.06 (176)	.23** (175)	.15* (195)	.20**(197)
Males (n)	.05 (89)	.11 (90)	.24* (89)	.10 (94)	.16 (95)
Females (n)	.14 (86)	.04 (86)	.21* (86)	.22* (101)	.22* (102)
Acceptance					
Total (n)	-.08 (175)	-.01 (176)	.01 (175)	.06 (195)	-.10 (197)
Males (n)	-.08 (89)	.05 (90)	.04 (89)	.09 (94)	.04 (95)
Females (n)	- .06 (86)	-.08 (86)	-.02 (86)	.04 (101)	-.05 (102)
Turning to Religion					
Total (n)	.11 (175)	-.10 (176)	.13 (175)	.08 (195)	.03 (197)
Males (n)	.14 (89)	-.06 (90)	.21* (89)	.15 (94)	.10 (95)
Females (n)	.05 (86)	-.10 (86)	.06 (86)	.05 (101)	-.07 (102)

	Perspective-Taking Humor	Aggressive Humor	Avoidant Humor	CHS	SHRQ
Focus on & Vent Emotion					
Total (n)	.15* (175)	.17* (176)	.06 (175)	-.08 (195)	.03 (197)
Males (n)	.21* (89)	.23* (90)	.21 (89)	.09 (94)	.18 (95)
Females (n)	.05 (86)	.17 (86)	-.11 (86)	-.21* (101)	-.15 (102)
Denial					
Total (n)	.03 (175)	.07 (176)	.24** (175)	-.09 (195)	-.04 (197)
Males (n)	.17 (89)	.16 (90)	.33**(89)	.03 (94)	.01 (95)
Females (n)	-.13 (86)	-.02 (86)	.12 (86)	-.19 (101)	-.10 (102)
Behavioural Disengagement					
Total (n)	-.01 (175)	.10 (176)	.11 (175)	-.07 (195)	-.16* (197)
Males (n)	.17 (89)	.16 (90)	.21 (89)	-.02 (94)	-.08 (95)
Females (n)	-.20 (86)	--- (86)	-.03 (86)	-.16 (101)	-.25* (102)
Mental Disengagement					
Total (n)	.23** (175)	.07 (176)	.34***(175)	.06 (195)	.08 (197)
Males (n)	.22* (89)	.14 (90)	.44***(89)	.12 (94)	.05 (95)
Females (n)	.25* (86)	-.01 (86)	.23* (86)	.01(101)	.11 (102)
Alcohol & Drug Use					
Total (n)	.14 (175)	.17* (176)	.04 (175)	-.08 (195)	-.05 (197)
Males (n)	.26* (89)	.27* (90)	.07 (89)	.01 (94)	--- (95)
Females (n)	.03 (86)	.01 (86)	-.01 (86)	-.21* (101)	-.11 (102)
Humor					
Total (n)	.44*** (175)	.27* (176)	.44***(175)	.45***(195)	.50***(197)
Males (n)	.55***(89)	.24* (90)	.46***(89)	.39***(94)	.56***(95)
Females (n)	.33** (86)	.30**(86)	.42***(86)	.50***(101)	.45***(102)

Note: ***p<.001, **p<.01, *p<.05

WUHI Perspective-Taking Humor. As hypothesized, Perspective-Taking Humor was positively related to Emotional Social Support and Humor. Perspective-Taking Humor was also positively related to Mental Disengagement, Instrumental Social Support, and Focus on and Venting of Emotion. Sex-differences were found in the relationship of Perspective-Taking Humor to Active Coping [Fisher's Z = -2.78, p<.01], and Behavioural Disengagement [Fischer's Z = 2.39, p<.05]. These differences indicated that males' with high scores on Perspective-Taking

Humor were less likely to report engaging in active coping and more likely to acknowledge a tendency to give up trying to solve their problems in response to stress; the opposite pattern was found for females.

WUHI-Aggressive Humor. As predicted, Aggressive Humor was positively related to Focusing on and Venting of Emotions, and negatively related to Restraint Coping for both males and females. However, contrary to expectation, the relationship between Aggressive Humor and the COPE Humor scale was not stronger for males than for females. Aggressive Humor was also significantly related to Alcohol and Drug Use. This relationship indicated that individuals who report greater tendency to make fun of others when threatened are more likely to consume intoxicants in the face of stress.

WUHI- Avoidant Humor. As expected, Avoidant humor was positively related to the COPE Humor scale. Also consistent with hypotheses, Avoidant Humor was positively related to Mental Disengagement, Denial and Restraint Coping, indicating that individuals who use more Avoidant Humor are also more likely to distract themselves, to deny the reality of the situation with which they are faced, and to restrain themselves from taking action in a stressful situation. In addition, Avoidant Humor was positively related to Emotional Social Support and Positive Reinterpretation and Growth, indicating that both males and females who obtained higher scores on this scale were more likely to report sharing their feelings with others and trying to see something positive in stressful situations than individuals with lower Avoidant Humor scores. No significant sex-differences were found in the relationship of Avoidant Humor to any of the COPE scales.

CHS. As predicted, the CHS was related to Humor and Positive Reinterpretation and Growth and was not a significant predictor of Emotional Social Support. Sex-differences in the relationship of the CHS to Focusing on and Venting of Emotions [Fisher's Z = 2.09, $p<.05$] were also found indicating that females with high CHS scores were least likely to vent negative emotion in response to stress. In contrast to females, males' scores on the CHS and Focusing On and Venting of Emotion were negligibly related.

SHRQ. As predicted, the SHRQ was positively related to Humor, and Positive Reinterpretation and Growth. The SHRQ was also positively related to Emotional Social Support and a number of scales relevant to problem-focused coping. For instance, the SHRQ was positively related to Planning, and Instrumental Social Support, and negatively related to Behavioural Disengagement, indicating that individuals who score higher on the SHRQ are more likely to make a plan of action, and to approach friends for advice, and are less likely to quit trying to solve problems they encounter.

Conclusions

The results of Pearson correlation analyses provided mixed support for our hypotheses regarding the relationship of the humor measures to that of other dispositional coping styles. Not surprisingly, all of the humor scales were positively related to Humor on the COPE. Where the humor scales were expected to differ was in their relationships with COPE subscales measuring positive reframing, social support, avoidance, and expression of negative emotion.

The profile of coping styles associated with the CHS, the SHRQ and the Aggressive Humor Scale were most consistent with hypotheses. The profiles found to be associated with the CHS and the SHRQ were uniformly positive. The results suggested that males and females who

obtained higher scores on both of these scales were more likely to try to positively reframe and learn from life stresses. In addition, the pattern of associations with the SHRQ suggested that individuals who obtained higher scores on this scale were more likely to turn to others for emotional and instrumental support, to make plans of action, and were less likely to give up on solving problems they encountered. One sex-difference was found in the relationship of the CHS to Focusing on and Venting of Emotion, which suggested that females with higher CHS scores were less likely to report venting negative affect; the CHS was negligibly related to this coping style among males. In contrast to the CHS and the SHRQ, the Aggressive Humor scale was associated with a uniformly negative coping profile, suggestive of difficulties controlling negative affect. As expected, higher scores on Aggressive Humor were associated with a greater tendency to focus on and vent negative emotion, and a lesser tendency to demonstrate restraint. In addition, Aggressive Humor was associated with a greater tendency to try to escape from problems through the use of intoxicants.

The pattern of relationships found to be associated with the Perspective-Taking Humor scale and the Avoidant Humor scale of the WUHI were not always consistent with hypotheses. Like the CHS and the SHRQ, the Perspective-Taking Humor scale was the only WUHI subscale expected to be a significant positive predictor of Positive Reinterpretation and Growth. However, Avoidant Humor proved to be a stronger predictor of this coping style than Perspective-Taking Humor. The failure of the Perspective-Taking Humor scale to predict Positive Reinterpretation & Growth is surprising given that approximately half of its items describe humorously reframing a distressing event. One possible explanation for this curious result may be attributed to timing. Common to Positive Reinterpretation & Growth, the CHS, SHRQ, and Avoidant Humor, but distinct from the Perspective-Taking Humor scale, is the assumption that attempts to create a positive emotional state occur

in response to an immediate stressor. The lack of a significant relationship between Positive Reinterpretation & Growth and the Perspective-Taking Humor scale may be due to the greater emphasis of this humor measure on the adoption of a humorous perspective toward past stressors than on those in the immediate present.

Also unanticipated was the finding that coping styles, such as the seeking of Emotional Social Support and Mental Disengagement, that were expected to demonstrate unique associations with Perspective-Taking Humor and Avoidant Humor, respectively, were significantly related to both humor scales. The positive associations of Perspective-Taking Humor and Mental Disengagement, and Avoidant Humor and Emotional Social Support are likely a function of the positive relationship between Perspective-Taking Humor and Avoidant Humor. Indeed, after partialing out the influence of Avoidant Humor, the relationship between Perspective-Taking Humor and Mental Disengagement was largely reduced [$r = .09$, n.s.]. By contrast, controlling for the influence of Perspective-Taking Humor on the relationship between Avoidant Humor and Mental Disengagement had little impact on the magnitude of this correlation [$r = .28$, $p<.001$]. A similar pattern of results was found after the influence of Perspective-Taking Humor on the relationship between Avoidant Humor and Emotional Social Support was statistically controlled [$r = .08$, n.s.]; controlling for the influence of Avoidant Humor on the relationship between Perspective-Taking Humor and Emotional Social Support did not effect the correlation [$r = .22$, $p<.01$].

The positive relationship of Perspective-Taking Humor to Focusing on and Venting Emotion and Instrumental Social Support, were not anticipated, but not surprising given the emphasis of this humor measure on sharing humorous stories with others about distressing events. Sex-differences in the relationship of Perspective-Taking Humor to problem-focused strategies such as Active Coping and

Behavioural Disengagement, suggest that males who report adopting a humorous perspective of their problems and sharing that humor with others, are least likely to make use of active problem-solving in response to stress. Thus, males' high scores on Perspective-Taking Humor might be indicative of ineffective coping.

All of the WUHI scales were significant predictors of some forms of emotion-focused coping that function to provide psychological and emotional distance in the face of stress. However, as expected, the Avoidant Humor scale was the strongest and most consistent predictor of avoidant coping strategies. Individuals who reported using humor to distract themselves and/or others from current stressful situations also reported a greater tendency to prevent themselves from thinking about stressors, to engage in denial, and to restrain themselves from acting too soon to address the problem. In light of its association with Denial, the positive association between Avoidant Humor and Positive Reinterpretation and Growth discussed earlier may be more indicative of a denial process than it is a realistic appraisal of an ongoing stressor.

General Conclusions

The results of this study suggest that complete discussion of the validity of the WUHI cannot be done without considering sex-differences. The first phase of the study investigated the convergent validity of the WUHI subscales with an established measure of the use of humor for coping, the CHS. The results suggest that the validity of the Aggressive Humor scale as a measure of the use of humor for coping has greater promise for males than for females. Disparaging others when threatened is not as likely to be representative of what females mean when they report using humor to cope than it is for males. However, even if more likely an indicator of male than of female coping behaviour, the failure of Aggressive Humor to demonstrate relationships with

Extraversion and Neuroticism, suggests that this humor scale measures something of less importance to adaptive functioning.

While Aggressive Humor seems more characteristic of males' use of humor, the relationship of the Perspective-Taking Humor scale to measures of personality and other dispositional coping styles suggest greater support for the validity of this humor measure among females. Consistent with the construct, the personality profile associated with females' reports on the Perspective-Taking Humor scale suggests that females with higher scores on this measure are likely to experience higher levels of positive affect and well-being, and enjoy playing with ideas, a cognitive style conducive to humor creation. The relationship of this humor measure to the COPE also suggests that potential benefits that might be associated with females' use of this coping strategy may have more to do with sharing their humorous perspective with others, than with reframing and trying to learn from stressful events. Males with higher Perspective-Taking Humor scores were also more likely to report turning to others for emotional support in response to stress. But, the personality profile found to be associated with their Perspective-Taking Humor scores suggests that males who report greater use of this kind of humor to cope would be least likely to create humor from their stressful experiences and, are more likely to be perceived by others as rude, competitive and hostile. This interpersonal style is not consistent with the philosophical, self-deprecating, benevolent kind of humor the Perspective-Taking Humor scale was thought to assess.

The personality and dispositional coping profile found to be associated with the Avoidant Humor scale did not suggest that this measure was more pertinent to either of the sexes, but it did suggest that the consequences associated with this kind of humor for coping might be worse for males than for females. As expected, the Avoidant Humor scale was significantly related to other coping strategies that involve emotionally and psychologically distancing one's self from an ongoing

stressor. However, the positive association between Avoidant Humor and Neuroticism among males suggests that using humor to try to distract one's self or others from anxiety provoking thoughts or situations might indicate poor coping with stress.

In contrast to the CHS and the SHRQ, none of the WUHI subscales were uniformly associated with personality and/or coping styles suggestive of adaptive functioning. The only sex-difference found to be associated with the CHS that could potentially address the differential outcomes in response to stress found in previous research is the significant relationship between Aggressive Humor and the CHS found only among males. However, the fact that Aggressive Humor was not a significant predictor of Extraversion or Neuroticism makes this an unlikely explanation. The results of this study suggest that the negative outcomes found to be associated with males' CHS scores in previous studies (e.g., Lefcourt et al., 1997) were more likely to have reflected the use of humor as a way of distracting one's self from an immediate stressor, rather than the tendency to use humor to cope by asserting one's dominance over others.

STUDY 3

The results of Study 1 and Study 2 confirm that humor as a coping strategy can be quite heterogeneous. Adopting and sharing a humorous perspective of one's self and the events that have threatened one's sense of well-being is one strategy. However, using humor to cope can also mean making fun of others when threatened, or thinking of funny things and acting silly in order to avoid anxiety provoking thoughts and situations. Furthermore, none of these ways of using humor to cope, at least as measured by the WUHI scales, are uniformly related to traits and dispositional coping styles that are predictive of positive adjustment. For example, sex-differences in the correlates of Perspective-Taking Humor and Avoidant Humor suggest that, on the whole, both of these ways of coping might predict better outcomes for females than for males. But even among females, the constellation of traits and coping styles with which these scales were associated produces a mixed picture. While the results of Study 2 are suggestive with respect to the potential benefits and limitations of different ways of using humor as a coping strategy, understanding how these potentials are manifest in real life can best be achieved by examining the behaviours and outcomes associated with them in particular situations.

This study evaluates the validity of the WUHI scales, the CHS and the SHRQ, by investigating their power to predict behaviour and mood both during and after a potentially stressful event created in the lab. It was also hoped that behaviours and outcomes observed in stressful events could be associated with each of the humor scales and individual differences such as sex and temperament. Such linkages would increase our understanding of the factors that might influence when and how humor is used for coping and the potential implications these factors may have on its effectiveness.

The Potentially Stressful Situation

The majority of studies investigating the potential benefits of humor for coping have typically defined humor solely on the basis of self-report measures. However, there are a few studies that have used behavioural indices of humor in evaluating the efficacy of humor for coping with stress. These few studies have used a paradigm in which mood disturbance among participants who either create a humorous or a serious narrative in response to a stressful film is compared (e.g., Lefcourt and Martin, 1986; Newman and Stone, 1996). These studies have demonstrated that transforming a distressing experience into a humorous story can be an effective means of reducing negative affect. However, while the paradigm used in these studies elicits active humor coping in a stressful situation, it does not fully embody some of the features of everyday stresses. For example, questions concerning whether or not individuals would choose to use humor to cope in specific situations, how they might do so if they chose to use humor and the potential benefits or limitations of humor in those situations were not raised. In this procedure the person watching a stressful film is given no choice but to relate to the stressor as a passive observer. In real life, the individual is actually a part of the unfolding stressful 'scene', and can choose to cope by either attempting to alter the stressor itself or manage his/her responses to it. Whether one uses humor in a problem-focused manner or as a means of coping with one's emotions may be more or less effective depending on the nature of the stressful situation with which one is faced. Also, although a film is capable of arousing negative affect, a live situation in which one's self-esteem and reputation is threatened comprises a different kind of stress, one that is presumably more representative of the kind of stressors encountered in daily life.

In order to better capture the flavor of a stressful life event, we decided to examine the use of coping humor during and after a failure experience. The lab situation used was similar to that described by

Lefcourt et al., 1995 and 1997, which examined the stress-moderating role of humor during stressful tasks. Participants were recruited under the guise that the study was an investigation of the relationship between cognition and mood. Once in the lab, participants completed a number of tasks, said to measure various aspects of intelligence. Given our interest in observing humor used as a means of coping with failure, participants were required to complete tasks with unachievable time pressure. False norms were provided to give the impression that the tasks were doable when, in fact, success was close to impossible.

There are a number of features of this lab situation that made it well-suited for observing how individuals use humor to cope with stress. First, the Stroop Test, and the Mental Arithmetic task, have been used commonly as stressful tasks. These tests have the capacity to threaten participants' views of their own intelligence, which for young undergraduates is likely to be an important source of self-esteem. The interactional nature of these tasks also provided a social context allowing for the communication of humor.

Although the greater ecological validity of this approach made it appealing, there was a risk that participants, in conformity with the behaviour typically expected of them in research studies, would inhibit their tendencies to use humor to cope. In order to increase the likelihood that people inclined to use humor for coping would do so in this situation, all participants were provided with a model of humor via a "demonstration video." The video, ostensibly shown for instructional purposes, focused upon an individual laughing and joking as he/she struggled with the same tasks the participants would be required to complete. It was hoped that the model for using humor in the lab would send an implicit message to those inclined to use humor to cope, that doing so was permissible. On the other hand, providing this model did not explicitly exact a demand for humor. Consequently, those not naturally inclined to be humorous would not feel pressured to behave

uncharacteristically. As a check upon these concerns, an interview was conducted at the end of the study in order to investigate the plausibility of the cover story, and whether or not the video gave away the study's actual intended purpose.

Our questions for this phase of the study concerned the comparability of the WUHI scales and established humor measures such as the CHS, and the SHRQ in predicting humor use for coping with these potentially stressful tests and subsequent moods. We were also interested in investigating potential sex-differences in the relationship of the humor scales to the dependent variables of interest.

Predicting Humor Behaviour and Mood in Response to the Stress Manipulation

As stated previously, researchers and theorists who have discussed the health-enhancing potential of humor have often characterized its benefits as arising from an ability to see one's self and the events that threaten well-being from a humorous perspective (Freud, 1928; Lefcourt & Martin, 1983; Lefcourt, et al.,1995; Lefcourt et al., 1998; May, 1953). May (1953) spoke of this ability as a way of obtaining a healthy "distance" from one's problems, a process which he distinguished from pathological coping styles such as denial or repression. Rather than trying to escape from the stressor entirely, the healthy distance afforded by humor allows the individual to stay in touch with problems, while reducing his/her emotional reactions to them (Lefcourt et al., 1995).

It is this kind of humor, which we have come to call "perspective-taking humor" (Lefcourt et al., 1995), that we hypothesized would be most beneficial for coping with the stressful situation to which participants were exposed in this study. We hypothesized that individuals who try to view their own short-comings and the stressful events they experienced from a humorous perspective would be most

likely to demonstrate humor in response to their mistakes as they fumbled through the cognitive tests. In other words, it was expected that individuals who obtain higher scores on measures designed to assess perspective-taking humor would smile, laugh and make humorous comments about themselves and the stressful tasks more than those with lower scores. It was also expected that individuals who reported a greater tendency to use perspective-taking humor for coping, would fare better with respect to moods following repeated failures than individuals less inclined to engage in perspective-taking humor.

Perspective-taking humor seems to be a form of emotion-focused coping, which is most likely to be beneficial in situations perceived to be uncontrollable. The potentially stressful situation created for this investigation was intended to be just that. Although designed to ensure that all participants would experience failure, it was possible that some participants would have more difficulty with the tasks than others. In comparison to those who "failed miserably", individuals who enjoyed some success, would likely feel less helpless and, in turn, less inclined to use and benefit from humor. Therefore, while measures of perspective-taking humor were expected to be positively associated with the demonstration of genuine humor and better mood in response to this situation, we anticipated stronger relationships among those who performed most poorly on the challenging tasks.

In contrast to measures of perspective-taking humor, neither aggressive or avoidant humor were expected to predict genuine humor behaviour, nor predict benefits with respect to mood. Rather than reflecting acceptance of one's own short-comings and the absurd in stressful life events, aggressive humor is characterized by humor and wit used to diminish others when a person feels threatened. In turn, aggressive humor reflects an assertion of one's superiority and control. In this situation, it was expected that individuals who report a greater tendency to make fun of others when threatened, would be more likely to

take themselves and the tasks seriously. Therefore, instead of experiencing humor, these individuals would be more likely to feel frustration and possibly anger in response to their repeated failures. Avoidant humor also involves the use of humor as a means of gaining control in social situations, but in a less confrontational manner. This can involve making jokes or acting silly as a way of avoiding conflict. On an intrapersonal level, avoidant humor can also involve thinking about something humorous in order to evade thinking about a problematic situation. While this approach may be useful under some circumstances, the stressful situation created for this study was not expected to be one of them. Avoidant humor would seem difficult and inappropriate during stress tests demanding sustained attention.

Using Humor to Cope in the Aftermath of a Stressful Experience

Given the conceptualization of humor as a form of emotion-focused coping, we also thought that it was important to observe how people used humor to cope when nothing could be done to alter the stressful situation itself, that is, after it has transpired. To do this, we made use of a story-telling task similar to the one used in the pilot study. After the stressful tasks, participants were taken to another room that was equipped with a telephone connected to a tape recorder. Participants were left alone to tell a funny story about their experiences in the lab to a friend who they imagined was listening on the other end of the telephone. This was undertaken to evaluate the power of the humor measures to differentially predict the types of humor communicated in those stories, the humorousness of the accounts, and the respondents' moods following this exercise.

Predicting Humor Behaviour and Mood in Response to the Story-Telling Task

Telling a humorous story about a distressing event can be an

expression of perspective-taking humor. Individuals with higher scores on measures of perspective-taking humor were expected to tell funnier stories about their short-comings and the absurdity of the lab situation than lower scoring individuals. Consequently, Perspective-Taking Humor was expected to be a predictor of moods following this exercise, with high humor respondents experiencing more positive affect than individuals low in humor.

Individuals who report making fun of others and engaging in wit as a means of coping with stress were also expected to tell funnier stories than individuals less likely to use this coping strategy. However, in contrast to measures of perspective-taking humor, aggressive humor was expected to predict "put down humor;" that is, sarcastic and derogating humorous remarks about others and the lab situation. In addition, individuals who report that they essentially use humor as a means of venting hostility were not expected to demonstrate benefits with respect to mood following the story-telling task. It was thought that expressing hostility, even in a humorous manner, would likely maintain or exacerbate feelings of negative affect.

Individuals who report a greater tendency to use humor to avoid thinking about stressors would be expected to demonstrate avoidance behaviour during this exercise. Rather than using the stressful situation as content for humor, these individuals would be more likely to make humorous comments or jokes that are tangentially or completely unrelated to the situation they just experienced. However, given the demands to comply with instructions, frequent examples of such behaviour were not expected so that the hypothesized relationship might be difficult to detect. Given the greater relevance of avoidant humor for coping with an event as it is happening, measures of this coping strategy were not expected to be significant predictors of mood following the story-telling task.

Trait-Cheerfulness

As discussed by Watson and Hubbard (1996), a common problem in the stress and coping literature has been the tendency to examine outcomes associated with specific personality characteristics and coping styles without assessing the variance that might be accounted for by higher-order traits, (e.g., Neuroticism). The same criticism can be raised against the literature investigating the stress-moderating role of humor. The higher-order trait most relevant to the manifestation of humor is trait-cheerfulness. Trait cheerfulness is "an affective trait, or temperament, presumably representing a habitually lowered threshold for the induction of exhilaration and laughter" (Ruch & Kohler, 1997, p.2). According to Ruch (1997), it is defined by five components: a prevalence of cheerful mood, a low threshold for smiling and laughter, a composed view of adverse life circumstances, a broad range of active elicitors of cheerfulness and smiling and laughter, and a generally cheerful interaction style. As part of their work, Ruch and colleagues have developed a measure of trait-cheerfulness (the State-Trait Cheerfulness Inventory; STCI-T, Ruch, Kohler, & van Thriel, 1996) and have found evidence to support its validity as a measure of temperament with consequences for humor. For instance, in comparison to less cheerful individuals, those who are higher in trait-cheerfulness have been found to laugh and smile more in response to humorous stimuli, be it a comical interviewer (Ruch, 1997) or nitrous oxide (i.e., "laughing gas") (Ruch & Stevens, 1995). The fact that trait-cheerfulness was positively associated with responsiveness to a stimulus that physically elicits laughter lends strong support for the validity of the STCI-T as a measure of the temperamental basis for humor. There is also evidence to suggest that individual differences in trait-cheerfulness may account for a significant amount of the variance in outcomes in response to adversity. Ruch and Kohler (1997) investigated the robustness of cheerful mood among those high and low in trait cheerfulness after exposing such

individuals to environments designed to elicit a cheerful, serious, or bad mood. The 'cheerful' room had large windows, yellow walls, and was decorated with funny posters, and balloons. By contrast, the room designed to elicit a bad mood was painted black, and was lit by a small frosted light bulb. Consistent with their hypotheses, Ruch and Kohler (1997) found that individuals higher in trait-cheerfulness maintained a cheerful mood and did not manifest elevations of a bad mood when exposed to the aversive environments. By contrast, those lower in trait-cheerfulness reported a significant decrease in cheerful mood and a significant increase in bad mood after being placed in rooms conducive to a serious or bad mood.

To date, there have been no studies that have included both measures of the use of humor for coping and trait-cheerfulness as predictors of outcomes under stress. As a result, it is not clear to what extent the favourable outcomes with which the CHS and the SHRQ have been found to be associated reflect the influence of a generally cheerful temperament, or more specifically, the use of humor. Given our interest in the latter, it was important to show that humor as a coping strategy, particularly as measured by the scales of the WUHI, predicts mood and behaviour above and beyond that attributable to a cheerful disposition. Trait-cheerfulness was therefore included as a predictor in this study in order to evaluate the incremental validity of the humor scales.

In addition to allowing us to test incremental validity, inclusion of trait-cheerfulness as a predictor would also allow us to investigate whether or not the predicted associations between measures of humor and the outcome variables of interest are dependent on temperament. A number of studies that have investigated the relationship between affect and cognition have found that the induction of positive affect increases cognitive flexibility as demonstrated by performance on creative problem-solving tasks (Isen, Daubman, & Nowicki, 1987) and the unusualness of free associations (Isen, Mitzi, Mertz, & Robinson, 1985).

This ability to make rapid cognitive shifts between frames of reference has long been thought to be central to humor (Koestler, 1964). It is therefore not surprising that individuals high in trait-cheerfulness report greater use of humor for coping than those who are less cheerful (Kohler & Ruch, 1996; Ruch & Carrell, 1998). Given their greater access to the necessary cognitive resources for humor, highly cheerful individuals could be expected to manifest humor as a coping strategy more so than their less cheerful counterparts. Therefore, we anticipated that any interactions found between trait-cheerfulness and measures of coping humor would reveal that scales expected to predict greater ability to use and benefit from humor would be most powerful among those higher in trait-cheerfulness.

Specific Hypotheses

The following specific hypotheses for each of the humor scales to the dependent variables of interest reflect the theoretical considerations just described, and the findings of past studies with the CHS and the SHRQ. If humor's predictive power is substantial, then relationships with criterion variables should supercede those attributable to cheerfulness. All relationships predicted are in a positive direction unless noted otherwise.

1. Perspective-Taking Humor was the only one of the WUHI scales expected to be related to humorous comments made about one's self and/or the challenging tasks, laughter and smiling during the stress manipulation. The CHS and the SHRQ were also expected to predict humor displays during the stress manipulation. However, given the results of our pilot study, which investigated sex-differences in the humor behaviours associated with these previously established humor scales, it was expected that the CHS and the SHRQ would be better predictors of humorous comments for males than for females,

and better predictors of female than of male laughter. Although the CHS and the SHRQ predicted the funniness and not the number of humorous quips males made in response to the audio-taped situations in the pilot study, it was assumed that competence at creating humorous comments on the spot should be related to the frequency with which individuals engage in this behaviour, and in turn, the likelihood with which they would make humorous comments in this situation.

2. Perspective-Taking Humor, the CHS and the SHRQ should be associated with greater positive affect and less negative affect in response to the stress manipulation. However, in light of sex-differences reported in the literature with respect to the outcomes in response to stress associated with the CHS, it was expected that the positive outcomes associated with this scale would only be demonstrated among females. Among males, higher scores on the CHS were expected to predict greater negative affect and reduced positive affect in response to this situation. Aggressive Humor and Avoidant Humor were expected to predict decreased positive affect and increased negative affect for both males and females.

3. Perspective-Taking Humor was expected to be related to the humorousness of participants' stories and the extent to which the humor focused on participants' difficulties with the tasks and/or the absurdity of the lab situation. If the CHS and the SHRQ also measure perspective-taking humor, they should demonstrate the same relationships with these outcome measures. Aggressive Humor was expected to be related to the humorousness of participants' stories, but was not expected to predict the criterion behaviours associated with perspective-taking humor. Aggressive Humor was expected to be associated with stories containing sarcasm and humorous

comments that derogated others and/or the tasks. Avoidant Humor was not expected to be a significant predictor of story-telling behaviour due to the infrequency with which off-task behaviour was anticipated to occur.

4. Perspective-Taking Humor scores, the CHS and the SHRQ were expected to be associated with increased positive affect and decreased negative affect in response to the story-telling task. Aggressive Humor was hypothesized to predict increased negative affect, whereas Avoidant Humor was anticipated to be irrelevant to moods after telling a humorous story about the experience in the lab.

METHOD

Participants

Sixty-four undergraduate students (31 males, and 33 females; mean age = 19.59, SD = 1.93) enrolled in an introductory psychology course at the University of Waterloo participated in the study. These individuals were selected from a pool of potential participants who had completed the WUHI and the CHS as part of a mass testing procedure. Participants were recruited by phone and asked to take part in a study investigating the relationship between cognition and mood. Participants were also informed that the study would require them to complete a number of tasks and questionnaires, would take approximately one hour to complete, and that they would receive partial course credit for their participation.

Procedure

The stress-manipulation was conducted in a room equipped with a video-camera and a television monitor. The video-camera was in full-view, positioned directly across from the desk where each participant was to be seated. In this way the camera provided a close-up of the participant's face. Once in the lab, the female experimenter reiterated the cover-story, and gave the participant a general overview of what would be required of him/her for the study. Participants were informed that they would be asked to complete some questionnaires, watch a video-tape demonstrating some of the cognitive tasks they would be asked to complete, and then complete the tasks themselves which, they were told, measured a range of cognitive abilities. They were also informed that their performance on the cognitive tasks would be video-taped in order to ensure accurate data collection; a second would be audio-taped for the same reason. The maintenance of confidentiality was emphasized, particularly with respect to the video- and audio-taped data. Participants were informed that the video-and audio-taped data would only be seen and heard by the experimenter and one or two other people who were specifically trained to code the tapes for the relevant data.

After obtaining informed written consent, participants completed three questionnaires: the STCI-T<60> (Ruch et al., 1996) which assessed

trait-cheerfulness, followed by a questionnaire which asked about their typical ways of responding to challenging situations, and then the PANAS (Watson, Clark & Tellegen, 1988), which assessed their mood at the moment. Participants were then shown the demonstration video, which was said to be for instructional purposes. The actual purpose was twofold: 1) to provide a model for using humor in the situation, and 2) to convey false norms regarding performance on the tasks. The video-tape shown to male participants featured a male laughing and joking as he attempted the tasks and interacted with the experimenter; the video-tape shown to females featured a female engaging in the same behaviour. These tapes were matched with respect to content, behaviour, and length. The male demonstration video was 5 minutes, 49 seconds long and the females demonstration video was 5 minutes, 55 seconds long. (See Appendix F, pg. 189 for a transcription of the demonstration video).

The stress-manipulation tasks demonstrated on the video were the Stroop Color-Word Test (Stroop; Stroop, 1938; Jensen & Roher, 1966), the Mental Arithmetic Task (MA; Rose, Grim, & Miller, 1984), and the Remote Associates Test (RAT; Mednick, S. A., 1959). Participants also completed a shortened version of the Double Entendre Word Association task (WA; Lefcourt, Gronnerud, & McDonald, 1973), which though a part of the stress-manipulation; was not presented in the demonstration video.

All of the tasks administered are difficult under the best of testing conditions. However, they were modified slightly in order to increase their difficulty and, in turn, to ensure that all participants would have a failure experience. Participants were required to give verbal responses to all tasks and perform under strict time-pressure. The requirement to perform as quickly as possible was further emphasized by the experimenter saying "Ready? Go." at the beginning of each task and by holding up the stop-watch in full view of the participant as she timed his/her performance.

The Stroop Color-Word Test, which has been used to study "cognitive interference," involves three subtests: the first involves reading a list of colours (e.g., red, green, blue) printed in black font, the second requires reading the same list of colours printed in conflicting colours (e.g., the word "blue" written in red ink), and the third requires

participants to identify the colour of ink in which the colour names are written (e.g., "red" in response to the word "blue" written in red ink). The words for each subtest were printed on an 8 x11 inch card which contained a total of 110 words (10 words/row). For the first two subtests, participants were given 30 seconds to read as many words as possible, and were told, in the demonstration video, that most people can finish reading most of the words on the card in that time. For the last subtest, which involved identifying the colour of the font in which the words were written, participants were required to complete the entire card as quickly as possible. They were told, via the demonstration video, that most people are able to do so in 45 seconds, and make no more than five errors.

The Mental Arithmetic task required participants to count backwards by 13's from 7783, naming as many correct numbers in the series as possible in 30 seconds. They were told that most people can name at least 10 numbers in the series correctly within that time.

The Remote Associates Test required participants to listen to three words and to then verbally identify the forth word that is related to all three (e.g., the fourth word linking the words "surprise", "line", and "birthday", is "party"). Participants were given three minutes in which to complete as many of the 15 items as possible and were told that most people are able to answer at least 10 items in that time. They were also instructed to "pass" on items to which they could not think of the answer. Participants were given another chance to provide an answer for passed items if time remained after all items were administered at least once.

The Double Entendre Word Association task was introduced, after completion of the RAT, as a task that measured verbal skills. Participants were read a list of words and, after each one, were required to respond as quickly as possible with the first word that came to mind. As implied by the name of this task, the list of 40 stimulus words included a number of sexual "double entendres". These started with the 13th item, "rubber", followed by words such as "bust" (item 16), and "snatch" (item 19) which were placed two words apart; after "snatch" the double entendres became more frequent, occurring after every other word. (See Appendix F, pp. 192 for a copy of this word list). Response latencies to each word were timed with a stopwatch and recorded. The

greater delay in response time to the double entendres is an index of the degree of conflict experienced in choosing between the two meanings when formulating a verbal response. Although not typically used as a stress task, it was thought that the conflict between conforming to the instructions and the demands to give socially appropriate responses would cause tension. In addition, it was also thought that the surprising and bizarre nature of this task would provide material for humor both during the stress-manipulation and for the story-telling task that was to follow.

Participants completed the PANAS again immediately following the word association task, which marked the end of the stress-manipulation. The average time to complete the stress-tasks was 13.21 minutes (SD = 1.38 min.), and the average time between mood assessments taken before and after the stress-manipulation was 21.31 minutes (SD = 1.30 min.). The time necessary for watching the demonstration video and to set up the video camera for recording accounted for the disparity between the time taken for the stress manipulation and that between mood assessments.

Subsequently, participants were taken to another room to complete the story-telling task, which was introduced as another verbal measure of creativity. The room was warmly lit and set up to look like a modest, but comfortable sitting room. The room was also equipped with a telephone that was surreptitiously connected to an audio-tape recorder. For this task, participants were asked to talk about their experience in the lab in a humorous way, like they would talk to a friend about other situations they have experienced. A number of additional instructions were also given in order to facilitate the production of humor. First, participants were asked to imagine they were sitting in a comfortable room in their house and that they were feeling relaxed. They were asked to take a few moments to picture in their mind someone with whom they would usually share experiences. It was then explained that they would be left alone in the room to tell their funny story to that particular friend who they were to imagine was listening on the other end of the telephone. Participants were told to take time to think about their story before they started. When they were ready, they were to pick up the phone and talk into the receiver, and then hang it up when they were

finished. Participants were informed that we were not at all interested in the accuracy of their account; the only thing they were required to do was to talk about their experience in the lab as a humorous story. In order to further promote an atmosphere conducive to producing humor, participants were also told that they were free to be as outrageous as they liked, that there were no limits on what they could and could not say, and were encouraged to have fun with the task. As a parting remark, the experimenter mentioned that it was difficult to hear what was happening in the room when the door was closed. Therefore, they were to open the door to let the experimenter know when he/she was finished with the task.

Participants completed the PANAS again immediately following the story-telling task. The average time between mood assessments from the end of the stress-manipulation to the end of the story-telling task was 7.03 minutes (SD = 2.08 min.). After reporting their moods, participants completed the Situational Humor Response Questionnaire. Unfortunately, a lack of space prevented the SHRQ from being included with the other humor measures in the mass-testing booklet that participants completed before entering the lab. Given the fact that the scale asks about the potential for experiencing humor in a range of situations as well as one's attitudes about humor, we decided to administer it at the end rather than at the beginning of the study in order to preserve the integrity of the stress-manipulation, and to minimize potential social desirability effects.

Finally, participants were given a process-debriefing interview. After gathering information regarding the plausibility of our cover story, the experimenter conveyed the actual purpose of the study, and reassured participants that their poor performance on the tasks had been inevitable. Qualitative reports regarding participants' phenomenological experience of the lab situation were also obtained (See Appendix G, pp. 198 for a copy of this interview script).

Questionnaire Measures

The Waterloo Uses of Humor Inventory (WUHI).

Study 1 provides a full description of the development and

psychometric properties of the WUHI Perspective-Taking Humor, Aggressive Humor, and Avoidant Humor scales, and a copy of this scale can be found in Appendix C, pp. 169. Internal consistency estimates for each of the scales in this sample were consistent with those reported earlier [Cronbach alpha for Perspective-Taking Humor = .85, for Aggressive Humor =. 84, and Avoidant Humor = .86]. Two-week and 4-week test-retest data on each of these scales had been collected from two undergraduate classes at the University of Waterloo. These data indicate that all of the WUHI scales demonstrate good stability. Two week test-retest reliability among 38 students for Perspective-Taking Humor, Aggressive Humor, and Avoidant Humor was found to be .93, .89, and .83, respectively [all p's <.01]. Four week test-retest reliability among 23 undergraduate students was found to be .72 for Perspective-Taking Humor, .76 for Aggressive Humor, and .64 for Avoidant Humor [all p's <.01].

The Coping Humor Scale (CHS, Martin & Lefcourt, 1984).

See Study 2 for a full description of this scale and its psychometric properties. A copy of this scale can be found in Appendix E, pp. 176. The internal consistency reliability for the CHS in this sample was .82.

The Situational Humor Response Questionnaire (SHRQ, Martin & Lefcourt, 1983).

A full description of this scale and its psychometric properties was presented in Study 2. A copy of this scale can be found in Appendix E, pp. 177. The internal consistency reliability for the SHRQ in this sample was found to be .81.

The State-Trait Cheerfulness Inventory – Trait Version <60> (STCI-T <60>, Ruch, Kohler, & van Thriel, 1996).

This 60-item measure consists of three subscales which assess the traits of cheerfulness, bad mood, and seriousness. Respondents are asked to rate the extent to which they agree or disagree with statements that refer to their moods and mentality in general, with response options ranging from "strongly disagree" (1) to "strongly agree" (4). Examples

of some of the items from the trait-cheerfulness scale include: "I am a cheerful person", "I can be made to laugh easily", and "I have a 'sunny' nature" (see Appendix for a full list of items from the trait-cheerfulness scale). Past research has found the trait-cheerfulness scale of the STCI-T<60> to have good internal consistency and test-retest reliability [Cronbach alpha = .93; test-retest reliability over a 3-week interval = .86]. The internal consistency estimate for the trait-cheerfulness scale in this sample was consistent with that reported in the literature [Cronbach alpha = .94]. (See Appendix F, pp. 187 for a copy of this scale).

The Positive Affect Negative Affect Schedule (PANAS, Watson, Clark & Tellegen, 1988)

The PANAS is a 20-item self-report measure of positive and negative affect. Examples of items that assess positive affect include "excited", "enthusiastic", "proud" and "inspired". Negative affect items include, "distressed", "hostile", "scared" and "guilty". The version administered to participants in this study asked them to rate the extent to which they felt each emotion at the moment, with response options ranging from "very slightly or not at all" (1) to "extremely" (5). Factor analytic studies reveal that the PA and NA scales are orthogonal; correlations between the two scales are typically below -.20. Both scales have been demonstrated to be sensitive to fluctuations in mood occurring in response to changes in the external environment (Clark and Watson, 1986; Watson, 1988), and show good convergent and divergent validity with other affect measures. Watson et al., (1988) report internal consistency reliabilities of .89 and .85 for the PA and NA scale respectively, when administered with 'present moment' time instructions. The internal consistency reliabilities for the PA scale scores obtained before the stress manipulation, after the stress manipulation and after the story-telling task were .88, .89, and .90, respectively. The internal consistency reliability of the NA scale at each of these three points of measurement was .77, .88, and .92. (See Appendix F, pp. 188 for a copy of this scale).

Task Performance

The number of correct responses on the Stroop, MA, and the

RAT, and the average response latency to the double entendre words on the WA task were measured for each participant. Performance on these measures were then standardized and combined into a Performance Index by summing the standardized accuracy scores on the Stroop, MA, and RAT, and subtracting the standardized average response latency score to the double entendre words on the Word Association task. Assigning a negative value to the response latency scores on the word association task reflects the assumption that the shorter the response latency, the less conflict participants experienced when responding to the sexual double entendres. This index demonstrated adequate internal consistency reliability [Cronbach alpha = .69]

Coding of facial behaviour during the stress-manipulation

Facial signs of "genuine humor" observed during the stress-manipulation were coded using the Emotional FACS version of the Facial Action Coding System (EMFACS, Friesen, & Ekman, 1984). Facial displays of genuine humor were defined by the presence of Duchenne smiles and laughter. A Duchenne smile, involves two muscle groups: the zygomatic major, which pulls the corners of the mouth up towards the cheekbones; and the orbicularis oculi, which surrounds the eye and gathers the skin from around the eye socket creating 'crows feet' at the outer corners (Ekman & Friesen, 1982). Duchenne laughter is defined by the action of the same facial muscles involved in a Duchenne smile, but is accompanied by audible laughter or respiration changes, and an open mouth (Keltner & Bonanno, 1997; Ruch, 1997). Both Duchenne smiles and laughter have been found to occur spontaneously in response to feelings of amusement and enjoyment (Ekman & Friesen, 1982, Ekman, Friesen, & O'Sullivan, 1988). By contrast, Non-Duchenne smiles and laughter, which do not involve the action of the orbicularis oculi muscles, occur most often when enjoyment is feigned in an attempt to conceal felt negative emotion (Ekman, Friesen, & O'Sullivan, 1988).

Measurements of Duchenne smiles and laughter were made from colour videotapes, which provided a close-up view of the participant's

face. The primary investigator, who was blind to participants' scores on all self-report measures, coded all of the data. A second trained coder, who was also blind to participants' scores on all self-report measures and the principal aims of the study, coded the videotape data for 6 randomly selected participants. The two coders watched and scored the videotapes separately. The videotaped recording of the participant's behaviour during the stress manipulation was watched in its entirety. The counter on the videocassette recorder was set to zero before viewing each participant's tape. The tape was paused every time a Duchenne smile or laugh occurred, and the exact position on the counter for each instance was noted. Inter-rater reliability was evaluated with the ratio used by Ekman and Friesen (1978) and other users of the FACS. This reliability ratio is calculated by summing the total number of agreements between the two coders of the type of facial action coded, multiplying this sum by two, and then dividing the result by the total number of instances of the behaviour found by each coder. Agreement was defined as behaviours scored which both coders agreed were displayed at the same point in time on the videotape. The ratio of agreement for Duchenne smiles was .60, and that for Duchenne laughter was .77. Correlations between coders' scores for the frequency of Duchenne smiles and laughter were also used to provide an index of inter-rater agreement. The correlation between coders' scores for Duchenne smiles was .85 [$p<.05$] and the correlation for coders' scores for Duchenne laughter was .96 [$p<.01$].

The internal consistency estimates calculated for each of these behaviours indicated that the frequency with which participants demonstrated Duchenne smiles and Duchenne laughter did not vary considerably between the various tasks used for the stress manipulation [Cronbach alpha for Duchenne smiles and laughter = .73, and .77, respectively].

Although not the primary focus of this study, an attempt was made to code Non-Duchenne smiles and laughter. The inter-rater

reliability of the coding of Non-Duchenne smiles was adequate when estimated by the ratio used by Ekman and Friesen, [agreement ratio = .60], but the correlation between the two raters was low [r = .33, n.s.]. Closer examination of the ratings made by the two coders indicated that 54% of their disagreements were due to the primary investigator identifying instances of Non-Duchenne smiles, which were not coded as smiles of any type by the other coder. Only 6% of the disagreements reflected differences in the classification of the type of smile identified by the primary investigator. The inter-rater reliability for non-Duchenne laughter was adequate [agreement ratio = .69, $\underline{r}$ = .93, $p<.01$]. However, this behaviour occurred infrequently, and the internal consistency reliability of the frequency of these displays across the stress manipulation tasks was low [Cronbach alpha = .56]. Given these difficulties, and the fact that the primary focus of this study was on the prediction of genuine humor during a stressful event, these data for Non-Duchenne smiles and laughter were not analyzed further.

Coding of humorous comments during the stress manipulation

A humorous comment was defined as any comment that either communicated a humorous appraisal of the situation, or involved some form of 'joke work' (e.g., exaggeration, irony), and was accompanied by a 'humor signal' such as a genuine smile, a genuine laugh, or a dramatic increase in the pitch or tempo of speech. For the most part, these included comments made in between the challenging tasks that were self-deprecating [e.g., "I don't think I'll be able to get the 1st one! (laugh)" before starting the MA task], or commented on the humorousness of the lab situation [e.g., "That's my fun for the day! (laugh)"]. However, playful responses made during the RAT and the Word Association task were also considered instances of humor production. For example, providing a humorous commentary of the RAT items [e.g., "Bizarre! (laugh)", followed by "Disgusting!(laugh)", and then "Not that one again!(laugh)" in response to a repeated item] and responding with double entendres in response to the neutral words on the

Word Association task [e.g., "Shag" (said in a drawn out manner with a smile) when given the target word 'carpet'] were considered humorous approaches to these tasks.

Self-deprecating humorous comments, humorous comments about the situation and playful responses on the stress tasks were all considered examples of perspective-taking humor. Aggressive humorous comments were also coded. These were defined as sarcastic remarks that were derogating of the lab situation or of others [e.g., "Oh no, I failed it." (exaggerated disappointment, said with a mocking tone)]. However, only two instances of this behaviour were noted. Given its rarity, this behaviour was excluded from subsequent analyses. Therefore, scores for total number of humorous comments comprise only instances of perspective-taking humor.

As in the coding of facial behaviour, the principal investigator, who was blind to participants' scores on all self-report measures, coded all of the video tape data for instances of this behaviour. First, all extraneous comments made during the stress manipulation, and responses on the RAT and the Word Association task expressed with or without a humor signal were noted. Each of these were then categorized as being either humorous or not humorous. Another trained coder, blind to participants' other scores and the purpose of the study, coded these data for 20% of the participants. The inter-rater reliability for humorous comments was high [Kappa = .85]. Internal consistency analyses indicated that humorous comments were rarely made in response to the colour naming task of the Stroop, and that inclusion of the number of comments made during this task in the total score compromised the reliability of this index. Thus, in order to improve its reliability and representativeness, the number of humorous comments made during the colour-naming task of the Stroop was not included in participants' total score [Cronbach alpha improved from .52 to .62].

Coding of stories

Participants' stories were carefully transcribed to include all words, speech errors, pauses and sounds, such as laughter. Changes in pitch, tempo, and emphasized words were also noted. These transcriptions were then parsed into units representing each complete

thought and coded for evidence of perspective-taking humor, aggressive humor, avoidant humor and humorousness.

Evidence of perspective-taking humor in participants' stories was drawn from statements about the self or the absurdity of the lab situation. These statements reflected the speaker's intent to share a humorous perspective or to make the listener laugh (Total Story Perspective-Taking Humor). Indicators of aggressive humor in participants' stories consisted of statements deriving humor from another's misfortune (e.g., laughing at the person in the demonstration video for making mistakes) and sarcastic or derogating humorous comments about the lab situation or about others that were intended to make the listener laugh (Total Story Aggressive Humor). Participants' stories were also coded for evidence of avoidant humor, which was defined as humorous comments that are tangentially or completely unrelated to the situation they experienced in the lab. However, as anticipated, evidence of avoidant humor during the story-telling task was quite rare. Therefore, no statistical analyses of this variable were conducted.

The principal investigator coded all participants' stories for different types of humor; another rater, blind to participants' scores on self-report measures and the purpose of the study, coded 10% of the data. The inter-rater reliability for the classification of the kind of humor demonstrated in each story was high (Kappa = .86) as were the inter-rater reliability estimates of the total amount of perspective-taking humor and aggressive humor [Total Story Perspective-Taking Humor, $\underline{r}$ =.97 $p<.05$; Total Story Aggressive Humor, $\underline{r}$ =1.0].

The humorousness of participants' stories was rated on a 4-point scale. Stories that did not contain any attempts to make the listener laugh (e.g., a matter-of-fact description of the situation), or that contained attempts at humor that failed to arouse mirth in the listener were rated as 'not humorous' (0). An attempt at humor was defined as a form of 'joke work', such as the use of exaggeration, a pun or play on words, sarcasm, or the use of a silly voice. Stories rated as 'slightly humorous' (1) contained some successful attempts at humor, but failed to arouse mirth in the listener more than they succeeded. To be rated as 'moderately humorous' (2), the majority of participants' attempts at humor had to be successful, but the overall humorousness of the story

was diluted by the inclusion of non-humorous content (e.g., long explanations of irrelevant details, the story starts humorously but the humor tapers at the end). To be rated as 'very humorous' (3) the majority of the story content had to communicate humor and the majority of attempts at humor had to be successful in arousing mirth in the listener. (See Appendix H, pp. 200-212, for a copy of the coding manual and examples of stories rated at each level of humorousness).

The inter-rater reliability of the humorousness ratings made by the principal investigator for participants' stories was evaluated against the ratings made by one male and one female rater, both of whom were blind to the purpose of the study and participants' scores on self-report measures. Each of these raters independently coded the stories told by 20% of the participants. The Story Humorousness ratings made by the principal investigator were significantly correlated with those made by the male [$r = .78$, $p<.01$] and the female rater [$r = .79$, $p<.01$].

RESULTS

The data are presented in sections that parallel the transaction of events as they occurred in the lab. First, the power of the humor scales to predict behaviour and mood during and immediately following the stress-manipulation is examined. Secondly, the predictive validity of these scales during and immediately after completing the story-telling task is considered.

All predictors used in hierarchical moderated regression analyses were centered in order to reduce collinearity between main effect and interaction terms (Aiken & West, 1991) and follow-up tests of the simple slopes were conducted according to the procedure outlined by West, Aiken, and Krull, (1996). An alpha level of $p \leq .05$ was adopted for all statistical tests.

The results of all analyses were examined for the influence of outliers. Outlying data were defined as extreme scores that significantly influenced the results of statistical analyses. The impact of extreme scores was determined by influence statistics (Pedhazur, 1997, pp. 47 to 59), and by the change in the results of analyses conducted with and without outlying data. One female participant's self-reports of NA and PA following the stress manipulation, and NA after the story-telling task were found to have an inordinate impact on the results. This participant's data were therefore eliminated from analyses pertaining to these mood outcome measures.

The Potentially Stressful Situation

Manipulation Check

As expected, participants' mean performance on each of the tasks scored for accuracy fell far short of the high standards communicated to them in the lab, hence confirming their difficulty (see Appendix I, pg.

213 for mean performance data on the stress tasks). Participants' total performance scores calculated across all of the tasks however, were normally distributed. Thus, although difficult, some individuals performed better on the tasks overall than did others.

On the basis of findings in the literature regarding mood change in response to failure, (e.g., Egloff, 1998) we expected participants' responses to the stress manipulation to demonstrate an increase in negative affect (NA) and a decrease in positive affect (PA) from baseline. Contrary to expectation, examination of mood change among the total sample indicated only an increase in NA. In addition, similar tests performed among males and females separately, indicated that this pattern of response was more typical of the males than of the females. Although baseline ratings of NA did not differ between the sexes, males reported greater NA than females after the experience [$t(61) = 2.29$, $p<.05$]. As indicated in Table 15, the change in males' NA from baseline was also significant. By contrast, females did not report an increase in NA. With respect to PA, absolute levels of PA reported before and after the manipulation did not differ between the sexes. However, females' reports of PA decreased significantly from baseline following completion of the challenging intellectual tasks. Therefore, although the manipulation generally succeeded in having a negative impact on participants' moods, it appears that males were likely to report feeling greater distress, whereas females were likely to report feeling a lessening of happiness and enthusiasm as a result of the experience.

Table 15: Comparison of PA and NA before and after the stress manipulation.

	TOTAL SAMPLE (N=63)						
	Mean	SD	t		Mean	SD	t
Pre-Stress NA	14.15	4.71		Pre-Stress PA	28.13	7.48	
Post-Stress NA	15.25	5.07	-1.95*	Post-Stress PA	27.32	7.51	1.35@
	MALES (n=31)						
	Mean	SD	t		Mean	SD	t
Pre-Stress NA	14.74	5.20		Pre-Stress PA	28.65	8.28	
Post-Stress NA	16.68	5.77	-2.19*	Post-Stress PA	28.52	8.91	0.13
	FEMALES (n=32)						
	Mean	SD	t		Mean	SD	t
Pre-Stress NA	13.63	4.19		Pre-Stress PA	27.63	6.72	
Post-Stress NA	13.88	3.88	-.39	Post-Stress PA	26.16	5.76	2.25*

Note: @p (one-tailed) <.10, *p (one-tailed) <.05

Interviews conducted with each participant at study completion confirmed that most participants did not suspect its actual intended purpose. Most participants thought that there was probably more to the study than what they were originally told, but either could not identify an alternative purpose of the study or guessed incorrectly. Only four of the 64 participants believed that the study had something to do with humor and all of them arrived at this conclusion after completing the story-telling task.

Descriptives

Table 16 presents the means, and standard deviations of the humor scales, trait-cheerfulness, and task performance for the total sample and for males and females, separately. The values obtained for the CHS, SHRQ, and Trait-Cheerfulness are comparable to those typically reported in the literature. The values obtained for the WUHI scales are also consistent with those found in Study 1 and 2; however, sex-differences in mean scores on Perspective-Taking Humor and Aggressive Humor that were found in Study 1, did not reach significance

in this sample. In addition, males and females did not differ in their overall performance on the tasks.

Table 16: Descriptives

Measure		N	Mean	SD	t
Perspective-Taking Humor	Total Sample	63	27.62	5.65	
	Males	30	26.93	5.30	
	Females	33	28.24	5.95	-.92
Aggressive Humor	Total Sample	63	16.27	4.47	
	Males	30	16.23	4.95	
	Females	33	16.30	4.07	-.06
Avoidant Humor	Total Sample	63	16.22	4.63	
	Males	30	16.43	5.21	
	Females	33	16.03	4.10	.34
CHS	Total Sample	62	19.13	4.85	
	Males	30	19.27	5.38	
	Females	32	19.00	4.39	.21
SHRQ	Total Sample	64	59.23	10.39	
	Males	31	59.52	10.82	
	Females	33	58.97	10.14	.21
Trait-Cheerful	Total Sample	64	62.19	9.62	
	Males	31	61.23	9.73	
	Females	33	63.09	9.55	-.77
Task Performance	Total Sample	64	.00	3.75	
	Males	31	-.24	4.33	
	Females	33	.22	3.16	-.48

Table 17 presents the correlation matrix for these same predictors among the entire sample. For the most part, intercorrelations among the WUHI scales and between each of the WUHI scales and the CHS in the total sample were consistent with those reported previously. However, the positive relationship between Avoidant Humor and the CHS in this sample was significantly higher than that found in Study 2 [Fisher's Z = 2.21, $p<.05$]. All of the humor scales, except for Aggressive Humor,

were significantly and positively related to Trait-Cheerfulness. The magnitude of the relationships between Trait-Cheerfulness and the previously established humor scales (the CHS and the SHRQ) were also consistent with those reported in the literature (e.g., Ruch et al., 1993). Aggressive Humor was the only scale that was significantly related to Task Performance. This relationship indicated that those with higher scores on Aggressive Humor performed better on the tasks overall than those with lower scores on this measure.

Table 17: Correlations

	Perspective-Taking Humor	Aggressive Humor	Avoidant Humor	CHS	SHRQ	Trait-Cheerful
Perspective-Taking	--					
Aggressive	.32* (n=63)	--				
Avoidant	.57** (n=63)	.32* (n=63)	--			
CHS	.37** (n=61)	.27* (n=61)	.73** (n=61)			
SHRQ	.40** (n=63)	.30* (n=63)	.54** (n=63)	.70** (n=62)		
Trait-Cheerful	.37** (n=63)	.08 (n=63)	.49** (n=63)	.57** (n=62)	.62** (n=64)	
Task Performance	.03 (n=63)	.33* (n=63)	.07 (n=63)	.19 (n=62)	.20 (n=64)	.02 (n=64)

*p<.05, **p<.01

Table 18 presents the correlations among predictors for males and females separately. In contrast to the results of Study 2, the magnitude of the relationship between Aggressive Humor and the CHS did not significantly differ between the sexes. However, the positive relationship between Aggressive Humor and the SHRQ was significantly stronger among males than among females [Fisher's Z = 1.98, p<.05]. A significant sex-difference was also found in the relationship between Trait-Cheerfulness and Task Performance. Trait-Cheerfulness was negatively related to overall performance on the tasks for females, but

was positively and marginally [p <.06] related to task performance for males [Fischer Z = 2.83, p<.05].

Table 18: Correlations between predictor variables among males and females separately.

	Perspective Taking Humor	Aggressive Humor	Avoidant Humor	CHS	SHRQ	Trait-Cheerful	Task Performance
P-TH		.44*	.63**	.43*	.62**	.69**	.12
	--	(n=30)	(n=30)	(n=29)	(n=30)	(n=30)	(n=30)
Ag H	.21	--	.41*	.33@	.52**	.18	.34@
	(n=33)		(n=30)	(n=29)	(n=30)	(n=30)	(n=30)
Av H	.56**	.21	--	.72**	.60**	.46**	.09
	(n=33)	(n=33)		(n=29)	(n=30)	(n=30)	(n=30)
CHS	.35*	.19	.74**	--	.71**	.69**	.17
	(n=32)	(n=32)	(n=32)		(n=30)	(n=30)	(n=30)
SHRQ	.23	.05	.46**	.69**	--	.73**	.33@
	(n=33)	(n=33)	(n=33)	(n=32)		(n=31)	(n=31)
T-Ch	.44*	-.04	.55**	.44**	.52**	--	.32@
	(n=33)	(n=33)	(n=33)	(n=32)	(n=33)		(n=31)
TP	-.08	.31@	.05	.22	-.04	-.39*	
	(n=33)	(n=33)	(n=33)	(n=32)	(n=33)	(n=33)	--

Note: 1. P-TH = Perspective-Taking Humor, Ag H = Aggressive Humor, Av H = Avoidant Humor, T-Ch = Trait Cheerfulness, TP = Task Performance.

2. Correlations for males are listed above the diagonal. Correlations for females are listed below the diagonal

3. @ p<.10, *p<.05, **p<.01

Predicting Humor Behaviour

Table 19 presents the raw and transformed means and standard deviations of each of the humor behaviours observed during the stress manipulation. The distributions for the number of humorous comments, genuine laughter and genuine smiles observed during the stress manipulation were all significantly positively skewed [Kolmogorov-Smirnov ≥.19, all p's <.001]. These variables were therefore transformed in order to better satisfy the assumption of normality necessary for parametric statistical tests. The distributions for Genuine Laughter and Genuine Smiling were normalized using a square root

transformation. Humorous Comments was transformed by dividing the sample into two groups: those who had not made any humorous comments (approximately 60% of the sample; coded 0) and those who had made at least one humorous comment during the stress manipulation (coded 1). All analyses were performed using the transformed variables.

Table 19: Raw and transformed means and standard deviations of observed humor behaviour during the stress manipulation.

		RAW	TRANSFORMED
		Mean (SD)	**Mean (SD)**
Humorous Comments	Total (n = 60)	1.0 (1.82)	.38 (.49)
	Males (n = 28)	.86 (1.86)	.29 (.46)
	Females (n=32)	1.13 (1.81)	.47 (.51)
Genuine Laughter	Total (n = 60)	6.61 (7.60)	2.21(1.32)
	Males (n = 28)	6.54 (9.19)	2.12 (1.46)
	Females (n=32)	6.69 (6.03)	2.29 (1.22)
Genuine Smiles	Total (n = 60)	7.58 (8.44)	2.26(1.59)
	Males (n = 28)	4.86 (6.54)	1.77 (1.35)
	Females (n=32)	9.97 (9.26)	2.70 (1.67)

Comparisons of the mean frequency of humor behaviours between males and females indicated that females demonstrated more genuine smiles during the stress manipulation than did males [t (58) = -2.35, $p<.05$]. Males and females did not differ in the frequency with which they made humorous comments, or demonstrated genuine laughter.

With respect to the relationship of the humor scales to humor behaviour, it was hypothesized that Perspective-Taking Humor and the SHRQ would be positive predictors of humorous comments about one's self and/or the tasks, genuine laughter, and genuine smiling. It was also hypothesized that the CHS would predict genuine humor during the stress manipulation, but would be a stronger predictor of humorous

comments for males than for females, and would be a stronger predictor of female than of male laughter.

Hypotheses regarding the relationship of the humor scales to signs of genuine humor during the stress manipulation received some confirmation. As indicated in Table 20, Perspective-Taking Humor, the CHS, and the SHRQ were all significant predictors of whether or not participants made humorous comments about themselves and/or the tasks during the stress manipulation, but were not significant predictors of genuine laughter or smiling.

Table 20: Correlations between observed humor behaviours and measures of humor, temperament, task performance, and pre-stress mood.

		Humorus Comments	Genuine Laughter	Genuine Smiles
Perspective-Taking Humor	Total (n)	.36** (59)	.12 (59)	-.01 (59)
	Males (n)	.34@ (27)	.07 (27)	.08 (27)
	Females (n)	.37* (32)	.17 (32)	-.11 (32)
Aggressive Humor	Total (n)	.13 (59)	.13 (59)	-.02 (59)
	Males (n)	.34@ (27)	.35@ (27)	.26 (27)
	Females (n)	-.10 (32)	-.14 (32)	-.25 (32)
Avoidant Humor	Total (n)	.16 (59)	.07 (59)	-.07 (59)
	Males (n)	.31 (27)	.28 (27)	.13 (27)
	Females (n)	.02 (32)	-.19 (32)	-.18 (32)
CHS	Total (n)	.27* (58)	.20 (58)	.06 (58)
	Males (n)	.40* (27)	.30 (27)	.15 (27)
	Females (n)	.15 (31)	.08 (31)	.05 (31)
SHRQ	Total (n)	.28* (60)	.18 (60)	.19 (60)
	Males (n)	.42* (28)	.10 (28)	.14 (28)
	Females (n)	.15 (32)	.28 (32)	.29 (32)
Trait-Cheerfulness	Total (n)	.18 (60)	15 (60)	.07 (60)
	Males (n)	.32 (28)	.17 (28)	.13 (28)
	Females (n)	.03 (32)	.13 (32)	-.02 (32)

Task Performance	Total (n)	-.05 (60)	-.27* (60)	.07 (60)
	Males (n)	-.15 (28)	-.34@ (28)	.03 (28)
	Females (n)	.05 (32)	-.19 (32)	.05 (32)
Pre-Stress NA	Total (n)	-.23@ (60)	-.02 (60)	-.12 (60)
	Males (n)	-.24 (28)	-.02 (28)	-.20 (28)
	Females (n)	-.19 (32)	-.01 (32)	-.01 (32)
Pre-Stress PA	Total (n)	-.07 (60)	-.04 (60)	.07 (60)
	Males (n)	-.14 (28)	-.23 (28)	-.11 (28)
	Females (n)	.02 (32)	.22 (32)	.29 (32)

Note: @ $p<.10$, * $p<.05$, ** $p<.01$

No significant sex-differences were found in the magnitude of the relationships between humorous comments and Perspective-Taking Humor, the CHS, and the SHRQ. However, the pattern of correlations in Table 20 suggested that Perspective-Taking Humor was a unique predictor of females' humorous comments, but was not substantially better at predicting males' humorous comments than any of the other humor scales. In order to test the discriminant validity of Perspective-Taking Humor for humorous comments within each sex, all of the humor scales were entered simultaneously as predictors of humorous comments in multiple regression analyses performed separately among males and females. The results of these analyses indicated that, indeed, Perspective-Taking Humor was the strongest and only significant predictor of females' humorous comments [$\underline{b} = .06$, $\underline{t}\ (25) = 3.42$, $\underline{p}<.01$], but was not significantly better at predicting males' humorous comments during the stress manipulation than any of the other humor scales [all $\underline{p}$'s $\geq .20$].

Neither Aggressive Humor nor Avoidant Humor were expected to be predictive of any of the behaviours observed during the stress manipulation for either sex. As indicated in Table 20, neither of these measures were related to humorous comments, genuine laughter, or genuine smiles. However, among males, Aggressive Humor

demonstrated stronger positive relationships with humorous comments and genuine laughter than was expected (both p's $<.10$). In addition, the relationship between Aggressive Humor and each of the observed behaviours was consistently negative among females and consistently positive among males. But Fisher's Z comparisons and moderated multiple regression analyses indicated that neither the magnitude nor the nature of the relationship between Aggressive Humor and laughter differed significantly between the sexes.

Evaluating the influence of task performance on the prediction of humor behaviour

As indicated in Table 20, Task Performance was the only variable that was significantly related to laughter during the stress manipulation. This relationship indicated that those who performed relatively poorly on the tasks laughed most, a pattern which is consistent with the suggestion that humor is incompatible with efforts to engage in active-problem solving (Lefcourt et al., 1998). However, did laughter among those who performed most poorly reflect the influence of coping or of a cheerful disposition? In order to investigate this question, a series of hierarchical multiple regression analyses were performed. We were interested in finding out whether any of the humor scales or Trait-Cheerfulness interacted with Task Performance in the prediction of laughter during the stress manipulation. In the event that a significant interaction was found, we expected that it would indicate that the relationship between humor or cheerfulness and laughter would be strongest among those who demonstrated the poorest performance on the tasks. We also included sex as a variable in order to investigate whether such relationships were dependent on whether the participant was male or female.

In analyses investigating the relationship between each measure of humor and laughter at varying levels of performance, the main effects for Sex, the humor measure of interest, and Task Performance were entered as a block on Step 1, followed by all 2-way interactions on Step 2, and the three-way interaction on Step 3. This series of analyses indicated that none of the humor measures interacted significantly with performance on the tasks in the prediction of laughter during the stress-manipulation. However, when Trait-Cheerfulness was used in the place of humor in the equation, a significant three-way interaction between this variable, Task Performance, and Sex was found [R^2 Change = .07, p <.05]. Analysis of the simple effects at moderate, high (one standard deviation above the mean) and low (one standard deviation below the mean) levels of performance for males and females indicated that, as predicted, Trait-Cheerfulness was significantly positively related to laughter exclusively amongst those who performed most poorly; however, this was only true for females [at low levels of performance, female b = .11, $t(52)$ = 2.06, p<.05; male b = .04, $t(52)$ = 1.39, n.s.].

Interestingly, although Aggressive Humor did not significantly interact with performance, it did significantly interact with Sex when included with Task Performance in the prediction of laughter [b (interaction) = -.15, $t(51)$ = -2.05, p<.05]. This interaction indicated that, after performance on the tasks was statistically controlled, males who reported a greater tendency to make fun of others when threatened, laughed more during the stress manipulation than their counterparts [b = .15, $t(51)$ = 2.97, p<.01]. In contrast to males, females' scores on Aggressive Humor were essentially unrelated to their displays of laughter [b = -.03, $t(51)$ = -.46, n.s.].

Similar regression analyses conducted to explore possible interactions between task performance and humor or cheerfulness in the prediction of other humor behaviours indicated that Aggressive Humor interacted significantly with Task Performance in the prediction of

genuine smiles during the stress manipulation [R^2 Change = .08, $p<.05$]. Analysis of the simple slopes at low, moderate, and high levels of performance indicated that Aggressive Humor was a negative but non-significant predictor of genuine smiling among those who performed at moderate and high levels, but was positively and significantly related to genuine smiling among those who performed relatively poorly on the challenging tasks [at low levels of performance, $b = .15$, $t(51) = 2.21$, $p < .05$]. Analyses of humorous comments revealed no relationship with the humor scales or Trait-Cheerfulness, in interaction with Task Performance.

The influence of Trait-Cheerfulness on the relationship between humor and humor behaviour in response to a potential stressor.

The positive bivariate relationships found for Perspective-Taking Humor, the CHS, and the SHRQ in the prediction of humorous comments provided some evidence to support the construct validity of these scales. In order to test their incremental validity over and above cheerful temperament, hierarchical multiple regression analyses were performed. In each analysis, Trait-Cheerfulness was entered in the first step, followed by the humor measure of interest (Perspective-Taking Humor, the CHS, or the SHRQ) on the second. The results of these analyses provided evidence to support the incremental validity of Perspective-Taking Humor, but not the CHS or the SHRQ. Perspective-Taking Humor accounted for 12.5% ($p < .01$) of unique variance in humorous comments after that attributable to Trait-Cheerfulness was taken into account. The CHS and the SHRQ accounted for 1.9%, and 3.2% (both n.s.) of the unique variance in humorous comments, respectively.

The significant positive relationships found between Aggressive humor and genuine smiles among individuals who performed relatively poorly on the tasks and between Aggressive Humor and laughter among

males after performance on the tasks was taken into account, were also reexamined to see whether these relatively surprising findings reflected the influence of a cheerful temperament. For each hierarchical regression analysis, the main effects for Sex, Trait-Cheerfulness, Aggressive Humor, and Task Performance were entered as a block on Step1, followed by all two-way interactions on Step 2, the three-way interactions on Step 3, and the four-way interaction on Step 4. The results of these analyses indicated that the interaction between Aggressive Humor and Task Performance in the prediction of genuine smiles remained significant after the variance attributed to Trait-Cheerfulness was taken into account [$p = .05$]. The significant interaction found between Aggressive Humor and Sex in the prediction of genuine laughter was also found to be independent of cheerful temperament [$p<.05$].

Summary

The results of these analyses support the construct and incremental validity of the Perspective-Taking Humor scale with respect to predicting humorous comments during a potentially stressful situation over and above trait-cheerfulness, though this pertained only to females. Although the CHS and the SHRQ were also positive predictors of this behaviour, neither predicted a significant amount of unique variance after that attributable to a cheerful temperament was taken into account. Counter to expectation, Aggressive Humor was also a unique predictor of humor behaviour during the stress-manipulation. Aggressive Humor was significantly related to genuine smiles among those who performed poorly, and was positively related to laughter among males, regardless of how they performed on the tasks. In contrast to males, having a cheerful temperament, and not the extent to which they use hostile humor to cope with threat, was positively related to female laughter, but only among those who performed relatively poorly on the challenging tasks.

Predicting Post-Stress Mood

The following analyses investigated the utility of the humor scales to predict change in negative affect (NA) and positive affect (PA) following the stress manipulation. Before conducting these analyses, correlations between NA and PA obtained at each point of measurement were calculated in order to affirm the independence of these scales. Analyses performed among the total sample indicated one small but significant negative correlation between baseline measures of NA and PA [$\underline{r} = -.27$, $\underline{n} = 64$, $\underline{p} < .05$]. However, examination of the correlations among males and females separately indicated that baseline measures of NA and PA were only related among males [$\underline{r}$ (males) = -.42, $\underline{n} = 31$, $\underline{p} < .05$; $\underline{r}$ (females) = -.11, n.s.]. Given the fact that the majority of the evidence indicated that these measures were fairly independent, we proceeded to analyse reports of NA and PA separately.

We were interested in investigating whether the humor scales predicted NA and PA following the stress manipulation after baseline measures of these affects were statistically controlled (residualized post-stress mood). Those with higher scores on Perspective-Taking Humor, the SHRQ, and females with higher scores on the CHS, were expected to fare the best with respect to their moods (lower NA and higher PA) following the stress manipulation. By contrast, Avoidant Humor, Aggressive Humor, and males' scores on the CHS were expected to predict worsened mood following the stress manipulation (higher NA and lower PA).

As indicated in Table 21, only hypotheses regarding the relationship between Avoidant Humor and residualized post-stress NA were partially supported. Males who reported a greater tendency to use humor to avoid or distract themselves in the face of stress, reported a significant increase in NA following the stress manipulation than their

male opposites. In contrast, females' reports of using avoidant humor were negatively but not significantly related to residualized post-stress NA. These apparent sex-differences in the relationship between Avoidant Humor and residualized post-stress NA were statistically significant as indicated by comparison of the relevant semi-partial correlations between the sexes [Fisher's $Z = 2.08$, $p < .05$].

Table 21: Correlations of humor measures, trait-cheerfulness, and task performance, with negative and positive affect before and after the stress manipulation.

	NEGATIVE AFFECT			POSITIVE AFFECT		
	Pre-Stress	Post-Stress	Residualized Post-Stress	Pre-Stress	Post-Stress	Residualized Post-Stress
Perspective-Taking Humor						
Total (n)	-.12 (63)	.06 (63)	.16 (63)	.11 (62)	.10 (62)	.02 (62)
Males (n)	-.23 (30)	.02 (30)	.20 (30)	.26 (30)	.22 (30)	.04 (30)
Females(n)	.01 (33)	.18 (33)	.21 (33)	.10 (33)	-.01 (33)	.07 (32)
Aggressive Humor						
Total (n)	.04 (63)	.03 (63)	.01 (63)	-.13 (62)	-.05 (62)	.08 (62)
Males (n)	.02 (30)	-.01 (30)	-.03 (30)	.02 (30)	.04 (30)	.05 (30)
Females(n)	.07 (33)	.12 (33)	.09 (33)	-.33@(33)	-.22 (33)	.15 (32)
Avoidant Humor						
Total (n)	-.16 (63)	.04 (63)	.17 (63)	.17 (62)	.09 (62)	-.07 (62)
Males (n)	-.15 (30)	.20 (30)	.37* (30)	.30 (30)	.13 (30)	-.16 (30)
Females(n)	-.18 (33)	-.26 (33)	-.16 (33)	.05 (33)	.01 (33)	.09 (32)
CHS						
Total (n)	-16.12	-.16 (62)	-.02 (62)	.32* (61)	.23@ (61)	-.03 (61)
Males (n)	-.36@ (30)	-.24 (30)	-.05 (30)	.47**(30)	.28 (30)	-.09 (30)
Females(n)	-.13 (32)	-.08 (32)	.01 (32)	.20 (32)	.12(32)	.10 (31)
SHRQ						
Total (n)	-.24@ (64)	-.15 (64)	-.02 (64)	.40**(63)	.30* (63)	-.05 (63)
Males (n)	-.28 (31)	-.17 (31)	-.01 (31)	.53**(31)	.40* (31)	.01 (31)
Females(n)	-.20 (33)	-.18 (33)	-.04 (33)	.33@(33)	.11 (33)	-.15 (32)
Trait-Cheerfulness						
Total (n)	-.38**(64)	-.35**(64)	-.16 (64)	.50**(63)	.44**(63)	.06 (63)
Males (n)	-.50**(31)	-.32@(31)	-.05 (31)	.70**(31)	.60**(31)	.14 (31)
Females(n)	-.24 (33)	-.12 (33)	-.26 (33)	.40* (33)	.24 (33)	.01 (32)
Task Performance						
Total (n)	-.12 (64)	-.17 (64)	-.12 (64)	.16 (63)	.20 (63)	.12 (63)
Males (n)	-.22 (31)	-.30 (31)	-.21 (31)	.39* (31)	.39*(31)	.11 (31)
Females(n)	.06 (33)	.12 (33)	.09 (33)	-.33@(33)	-.11 (33)	.25 (32)

Note: @p< .10, *p<.05, **p< .01

A hierarchical regression analysis was also performed to further investigate the apparent sex-difference in the relationship between

Avoidant Humor and NA in response to the stress manipulation. In this analysis, Pre-stress NA was entered as a covariate on Step1, followed by Sex on Step 2, Avoidant Humor on Step 3, and the interaction between Sex and Avoidant Humor on Step 4. Significant main effects were found for Sex and Avoidant Humor, indicating that males, and individuals with higher scores on Avoidant Humor reported greater NA after the potentially stressful laboratory tasks than females and those lower on Avoidant Humor. However, these main effects were qualified by the significant interaction [R^2Change = .04, p<.05]. This interaction indicated that for males, Avoidant Humor was positively related to increased NA following the stress manipulation [b = .31, $t(58) = 2.29$, p<.05], but was a negative and non-significant predictor of residualized Post-stress NA for females [b = -.13, $t(58)$ = -.80, n.s.].

The influence of task-performance on the relationship between humor and post-stress mood.

As in the prediction of humor behaviour during the stress manipulation, analyses were conducted to investigate whether the relationship between humor and mood in response to this lab situation varied as a function of the level at which individuals performed on the challenging tasks. The relationship between Trait-Cheerfulness and mood at varying levels of task performance was also examined. Consistent with the view of humor as a form of emotion-focused coping, it was generally expected that humor's associated benefits should be most apparent among those whose active problem-solving efforts on the stress tasks were the least successful. It was assumed that, in comparison to those who were able to provide at least some correct answers, individuals who failed miserably on the tasks would be likely to feel greater helplessness. As a result, these individuals would also be more likely to focus on managing their emotional responses to the situation. Those among them who report greater use of humor for coping should

report better mood than those who performed just as poorly, but who report a lesser tendency to use humor for coping with adversity.

In order to investigate these hypotheses, a series of hierarchical multiple regression analyses were performed. In each analysis, Pre-stress mood (either NA or PA) was entered as a covariate on Step 1, and the main effects for Sex, either the humor measure of interest or Trait-Cheerfulness, and Task Performance, were entered as a block on Step 2. The two-way interactions were entered on Step 3, and the three-way interaction was entered on Step 4. The results of these analyses indicated that neither the humor measures nor Trait-Cheerfulness significantly interacted with Task Performance in the prediction of residualized post-stress NA. However, the prediction of PA in response to the stress manipulation from measures of humor and cheerful temperament was dependent on how individuals performed on the challenging tasks. Both the CHS and the SHRQ interacted significantly with Task Performance in the prediction of residualized post-stress PA [R^2 Change = .03 and .04, for the CHS and the SHRQ, respectively]. Simple effects analyses indicated that, among those who performed relatively poorly, humor as measured by either the CHS, or the SHRQ, only negligibly related to PA in response to the stress manipulation [p's > .20]. However, the relationship between humor as assessed by both of these measures, and Post-stress PA became increasingly negative with increased levels of Task Performance. The negative relationship between PA and the CHS and the SHRQ was strongest at high levels of task performance, but these relationships were only marginally significant [b(CHS) = -.42, t(55) = -1.95, p< .06; b(SHRQ) = -.17, t(55) = -1.66, p = .10].

As with the CHS and the SHRQ, a marginally significant interaction between Avoidant Humor and Task Performance [R^2 Change = .02, p < .06] indicated a trend for the negative relationship between Avoidant Humor and PA to become stronger with increasing levels of

task performance. Follow-up simple effects analyses indicated that the negative relationship between Avoidant Humor and residualized Post-stress PA was negligible among those who performed relatively poorly [b = -.04, t(55)= -.19, n.s.], marginally significant among those who demonstrated moderate levels of performance on the challenging tasks [b = -.32, t(55) = -1.78, p <.10], and statistically significant among those who performed relatively well [b = - .60, t(55) = -2.24, p <.05].

In contrast to humor, the significant interaction between Task Performance and Trait-Cheerfulness [R^2 Change = .04, p <.05] indicated that those who performed relatively poorly on the tasks and who were also more temperamentally cheerful reported higher levels of PA in response to the stress manipulation than less cheerful individuals who performed just as poorly [at low levels of Task Performance, b = .22, t(55) = 1.98, p < .06]. Trait-Cheerfulness was essentially unrelated to residualized Post-stress PA at moderate and high levels of Task Performance.

The influence of Trait-Cheerfulness on the relationship between humor and post-stress mood

The preceding analyses suggest that having a cheerful temperament, and not the use of humor as a coping strategy, predicted benefits for mood in response to the stress manipulation. In fact, in some cases, a greater tendency to use humor to cope was associated with worsened mood following the potentially stressful tasks. This was particularly true of Avoidant Humor. As expected, Avoidant Humor predicted significantly less PA for both males and females, and significantly greater NA for males in response to the stress manipulation. In contrast to the males, females' scores on Avoidant Humor were negatively, but not significantly, related to residualized post-stress NA. However, to what extent was this sex-difference influenced by Trait-Cheerfulness? Inspection of the correlations in Table 20 suggest that the

influence of Trait-Cheerfulness on the relationship between Avoidant Humor and residualized Post-Stress NA might be greater for females than for males. Therefore, it may be that the relationship between Avoidant Humor and NA would be more similar for males and females once the variance attributed to a cheerful temperament was taken into account. In order to investigate this possibility, a hierarchical regression analysis was performed similar to the one conducted previously, only this time Trait-Cheerfulness was included as a covariate. Pre-stress NA and Trait-Cheerfulness were entered as covariates on Step 1, followed by Sex on Step 2, Avoidant Humor on Step 3, and the interaction between Avoidant Humor and Sex on Step 4. This analysis indicated that when Trait-Cheerfulness is taken into account, the nature of the relationship between Avoidant Humor and residualized Post-Stress NA among females becomes more similar to that found among males. Avoidant Humor remained a non-significant predictor of females' reports of NA in response to the stress manipulation, but the direction of the relationship became more positive once trait-cheerfulness was taken into account. As a result, the main effect for Avoidant Humor remained significant [$\underline{R^2}$ $\underline{\text{Change}}$ = .04, $\underline{p}$<.05] and the previously significant interaction between Avoidant Humor and Sex was reduced to a trend [$\underline{R^2\ \text{Change}}$ = .032, $\underline{p}$<.07; $\underline{b}$ (males) = .40, $\underline{t}$(57) = 2.84, $\underline{p}$ <.01; $\underline{b}$ (females) <.01, $\underline{t}$(57)=.02, n.s.]. Thus, while Avoidant Humor was a stronger predictor of NA for males than for females, the nature of the relationship did not differ significantly between the sexes once the variance attributed to Trait-Cheerfulness was taken into account.

Summary

As expected, Avoidant Humor predicted greater NA in response to the stress manipulation, and the strength of this relationship was greater for males than for females. Avoidant Humor also predicted less PA, particularly among those who performed relatively well on the

challenging tasks. A similar pattern in the prediction of PA was found with the CHS and the SHRQ. Trait-Cheerfulness was the only measure that predicted benefits with respect to mood in response to the challenging tasks. Among those who demonstrated the poorest performance on the tasks, individuals who were higher in cheerfulness reported greater PA immediately following the stress manipulation than their less cheerful counterparts. This was found after pre-existing differences in reported levels of PA obtained before the stress manipulation were statistically controlled. Thus, the evidence suggests that it is having a cheerful temperament, and not the extent to which participants tend to use humor as a coping strategy, which appears to have "buffered" individuals from experiencing distress in this situation.

The Story-Telling Task

Story-Telling Behaviour

Participant's stories were coded for the different types of humor communicated, and their humorousness. Again, as was the case with many of the humor behaviours observed during the stress manipulation, the variables coded from the story-telling task were positively skewed [Kolmogorov Smirnov $\geq$ .17, all p's <.001]. The positively skewed distribution for the total amount of perspective-taking humor (Story Perspective-Taking Humor) communicated in participants' stories (the extent to which their attributions and attempts to arouse mirth in others emphasized their own short-comings or the absurdity of the lab situation) was normalized using a square root transformation. However, neither a square root transformation nor a logarithmic transformation succeeded in normalizing the other skewed variables. Instead, the data for the total amount of aggressive humor (Story Aggressive Humor) communicated (sarcastic or derogating humorous attributions or joking comments about others or the lab situation) was used to form two groups, those who had demonstrated at least one instance of hostile humor (approximately 40%

of the sample, coded 1) and those who had not (coded 0). The humorousness of participants' stories, which was originally scored on a 4 point scale, was reduced to a 3-point scale by combining the moderately, and very humorous categories into one. This approach minimized the influence of outliers (the 10% of participants whose stories were rated as being "very humorous"), while not compromising power.

Table 22 presents the raw and transformed means and standard deviations of the variables coded to represent different aspects of participants' stories about their experience in the lab. All analyses were done on the transformed variables. Comparison of the means obtained for males and females on each of the coded variables indicated no significant sex-differences.

Table 22: Raw and transformed means and standard deviations of coded variables for the story-telling task

		RAW	TRANSFORMED
		Mean (SD)	**Mean (SD)**
Story Perspective-Taking Humor	Total (n = 61)	4.00 (3.43)	1.76 (.96)
	Males (n = 30)	3.67 (3.76)	1.57 (1.11)
	Females (n=31)	4.32 (3.10)	1.94 (.76)
Story Aggressive Humor	Total (n = 61)	.62 (1.02)	.38 (.49)
	Males (n = 30)	.67 (1.09)	.37 (.49)
	Females (n=31)	.58 (.96)	.39 (.50)
Story Humorousness	Total (n = 61)	1.05 (.92)	.95 (.74)
	Males (n = 30)	1.13 (.90)	1.03 (.72)
	Females (n=31)	.97 (.95)	.87 (.76)

Predicting story-telling behaviour

Perspective-Taking Humor, the CHS and the SHRQ were expected to predict the total amount of story perspective-taking humor. That is, participants with higher scores on these scales were expected to talk more about perceiving their difficulties with the tasks as humorous, and their attempts to make the listener laugh, regardless of their success,

were also expected to highlight their short-comings and the absurdity of the lab situation. Perspective-Taking Humor, the CHS and the SHRQ were also expected to be positively associated with the humorousness of their accounts.

It was not clear whether sex-differences in the prediction of the amount of aggressive humor in participants' stories from scores on the CHS and the SHRQ would be found. As previously described, the results of our first pilot study did not provide any evidence to suggest that male coping humor, as measured by these scales, is more likely to be associated with stories that make fun of others than is female coping humor. On the other hand, both the CHS and the SHRQ have been found to be more strongly positively related to the Aggressive Humor scale among males than among females. Thus, if sex-differences in the relationship of the CHS or the SHRQ to story-telling behaviour were found, it was expected that they would indicate that only males' scores on these scales would be significantly positively related to the amount of aggressive humor contained in their stories. In contrast to the CHS and the SHRQ, both males' and females' scores on the Aggressive Humor scale were expected to be positively related to the humorousness of participants' stories and the number of sarcastic and derogating humorous comments made during the story-telling task. Avoidant Humor was not expected to be a significant predictor of story-telling behaviour for either males or females.

As indicated in Table 23, predictions regarding the relationship between the humor scales and the measured characteristics of participants' stories were partially supported. Counter to expectation, the Perspective-Taking Humor scale was not significantly related to the total amount of perspective-taking humor in individuals' stories, an index which combines the total number of humorous attributions about themselves and the tasks with the number of attempts to be humorous that emphasized personal short-comings and the absurdity of the lab

situation. However, positive relationships that approached significance were found for the CHS [$p<.10$] and the SHRQ [$p<.06$], and a statistically significant positive relationship was found for Trait-Cheerfulness in the prediction of Story Perspective-Taking humor. With respect to the relationship between Trait-Cheerfulness and Story Perspective-Taking Humor, inspection of the correlations obtained among males and females separately indicated that these variables were positively related for males and negatively, but not significantly related for females. Comparison of the correlations obtained for males and females indicated that this difference was statistically significant [Fisher's $Z = 2.21$, $p<.05$]. Hierarchical regression analyses using Sex, Trait-Cheerfulness, and the interaction as predictors of the total amount of perspective-taking humor in participants' stories further confirmed that the nature of the relationship between Trait-Cheerfulness and this aspect of participants' accounts differed significantly between the sexes [R^2Change (Sex x Trait-Cheerfulness interaction) = .08, $p<.05$].

Table 23: Correlations of story-behaviour measures with measures of humor, temperament, and post-stress mood.

		Story Perspective-Taking Humor	Story Aggressive Humor	Humorousness
Perspective-Taking Humor	Total (n)	.17(61)	-.20(61)	.23@(61)
	Males(n)	.07(30)	-.15(30)	.30(30)
	Females (n)	.26(31)	-.26(31)	.21(31)
Aggressive Humor	Total (n)	.14(61)	.13(61)	.25@(61)
	Males(n)	.18(30)	.11(30)	.43*(30)
	Females (n)	.06(31)	.17(31)	.05(31)
Avoidant Humor	Total (n)	.20(61)	-.09(61)	.03(61)
	Males(n)	.25(30)	-.09(30)	.22(30)
	Females (n)	.12(31)	-.09(31)	-.19(31)
CHS	Total (n)	.25@(59)	-.01(59)	.04(59)
	Males(n)	.29(29)	.03(29)	.28(29)
	Females (n)	.20(30)	-.05(30)	-.24(30)
SHRQ	Total (n)	.24@(61)	.02(61)	.12(61)
	Males(n)	.29(30)	.11(30)	.44*(30)
	Females (n)	.19(30)	-.09(31)	-.20(31)
Trait-Cheerfulness	Total (n)	.27*(61)	-.06(61)	.04(61)
	Males(n)	.46*(30)	.05(30)	.34@(30)
	Females (n)	-.10(31)	-.18(31)	-.25(31)
Post-Stress NA	Total (n)	-.20(61)	-.10(61)	.14(61)
	Males(n)	-.12(30)	-.05(30)	.07(30)
	Females (n)	-.14(31)	-.19(31)	.19(31)
Post-Stress PA	Total (n)	.17(61)	-.27*(61)	.01(61)
	Males(n)	.31@(30)	-.15(30)	.16(30)
	Females (n)	-.02(31)	-.47**(31)	-.26(31)

Note: @p< .10, *p<.05, **p< .01

Positive relationships that approached significance were found for both Perspective-Taking Humor and Aggressive Humor in the

prediction of the humorousness of participants' stories. In other words, individuals who reported a greater tendency to tell humorous stories about their embarrassing and distressing experiences, as well as those who reported being more likely to engage in wit and to tell stories that highlight others' shortcomings, told funnier stories than their counterparts. Interestingly, while the magnitude of the positive relationship between Perspective-Taking Humor and Story Humorousness was approximately equal between the sexes, the positive relationship between Aggressive Humor and this variable was significant for males, but negligible for females. However, statistical comparison of the magnitude of the relationship between Aggressive Humor and Story Humorousness among males and females indicated that this apparent difference was not significant [Fisher's Z = 1.52, p>.10].

Neither the CHS, nor the SHRQ were significant predictors of the humorousness of participants' accounts when evaluated among the total sample. However, inspection of the correlations obtained among males and females separately indicated that the SHRQ was positively related to the humorousness of males' stories, and was negatively, but not significantly related to the humorousness of females' accounts. A similar pattern was found with the CHS, however the relationship was not significant for either sex. The apparent sex-difference in the relationship between the SHRQ and the humorousness of participants stories was statistically significant as indicated by comparison of the correlations obtained among males and females [Fisher's Z = 2.50, p<.05] and the regression coefficients [R^2Change (SHRQ x Sex interaction) = .09, p<.05]. Similar analyses performed to compare the association between the CHS and Story Humorousness among males and females indicated that the apparent sex-difference in the magnitude and nature of this relationship was marginally significant [Fisher's Z = 1.95, p<.06; R^2Change (CHS x Sex interaction) = .06, p< .06].

The relationship between Trait-Cheerfulness and the

humorousness of participants' stories mirrored the predictive relationships found with the CHS and the SHRQ. As with both of these humor measures, Trait-Cheerfulness demonstrated a positive relationship to the humorousness of males' stories and a negative trend in the prediction of the humorousness of females' stories. These sex-differences were also statistically significant [Fisher's $Z = 2.25$, $p<.05$; R^2Change (Sex x Trait-Cheerfulness interaction) = .08, $p<.05$].

Aggressive Humor was not related to the amount of sarcastic and/or derogating humor in participants' stories. In fact, none of the humor scales were significant predictors of whether or not participants' stories contained aggressive humor. The fact that neither the CHS nor the SHRQ predicted this behaviour is consistent with the findings of our pilot study, reported earlier, which made use of a similar story-telling task. The only significant predictor of whether or not participants demonstrated wit and sarcasm during their account of the lab experience was their level of PA immediately following the stress-manipulation. This relationship indicated that individuals who reported lower levels of PA immediately following the stress-manipulation were more likely to demonstrate hostile humor during the story-telling task.

Evaluating the influence of Trait-Cheerfulness on the relationship between measures of using humor to cope and story-telling performance

The results of correlation analyses indicate that the Perspective-Taking Humor scale was not directly related to the total amount of perspective-taking humor communicated by participants during the story-telling task. However, we wondered whether the expected relationship between the Perspective-Taking Humor scale and Story Perspective-Taking humor was influenced by the significant interaction between Trait-Cheerfulness and Sex. In order to investigate this possibility, a hierarchical regression analysis in the prediction of Total Story Perspective-Taking Humor was performed. For this analysis, the

main effects for Sex, Trait-Cheerfulness, and Perspective-Taking Humor were entered as a block on Step 1, followed by all 2-way interactions on Step 2, and the 3-way interaction on Step 3. A significant 3-way interaction between Sex, Trait-Cheerfulness, and Perspective-Taking Humor was found [R^2Change = .07, $p<.05$]. Follow-up analyses of the simple-effects at low, moderate, and high levels of Trait-Cheerfulness for males and females indicated that the relationship between females' scores on the Perspective-Taking Humor scale and Story Perspective-Taking Humor was consistently positive, but non-significant, across all levels of Trait-Cheerfulness. A similar relationship was found among high cheerful males. But, the relationship between males' scores on the Perspective-Taking Humor scale and Story Perspective-Taking Humor became increasingly negative at lower levels of cheerfulness. The negative relationship between males' scores on the Perspective-Taking Humor scale and the extent to which they demonstrated this kind of humor during the story-telling task was not significant among moderately cheerful males but was significant among males who were low in trait-cheerfulness [$b = -.11$, $t(53) = -2.19$, $p<.05$].

Hierarchical regression analyses were also performed to examine the relationship between each of the humor scales and the humorousness of participants' stories. In light of the significant interaction between Trait-Cheerfulness and Sex found in the prediction of humorousness, the main effects for Sex, Trait-Cheerfulness and the humor measure of interest were entered as a block on Step 1, followed by all 2-way interactions on Step 2, and the 3-way interaction on Step 3. The results of the analyses when Perspective-Taking Humor was used as the measure of humor did not differ from those indicated by the correlation analyses reported earlier. Perspective-Taking Humor was a marginally significant predictor of story humorousness when the main effect for Trait-Cheerfulness was included in the equation, but did not demonstrate incremental validity in the presence of the statistically significant Trait-

Cheerfulness by Sex interaction. By contrast, the Aggressive Humor scale proved to be a stronger predictor of the humorousness of participants' stories than the Trait-Cheerfulness by Sex interaction. Among the main effects, Aggressive Humor was the only predictor that approached statistical significance [$p<.06$]. When the interaction terms were entered into the prediction equation, the main effect for Aggressive Humor became statistically significant and the interaction between Trait-Cheerfulness and Sex became non-significant. Thus, the extent to which individuals reported that they engaged in wit and hostile humor in the face of interpersonal stresses was a stronger predictor of the humorousness of participants' stories than the combined predictive power of cheerful temperament and sex.

Analyses performed using the SHRQ as the measure of humor indicated that this humor measure was redundant with Trait-Cheerfulness in the prediction of Story-Humorousness. Neither scale demonstrated significant main effects or interactions when entered together in the prediction equation. Diagnostic statistics indicated that high collinearity between these variables had adverse effects on the estimation of their regression coefficients. The same difficulty with collinearity was found when the CHS was used as the measure of humor in the prediction of the humorousness of participants' stories.

Summary

The relationship between the Perspective Taking Humor Scale and the total amount of perspective-taking humor in individuals' stories was moderated by participants' sex and cheerful temperament. The Perspective-Taking Humor scale was statistically unrelated to the perspective-taking humor evident in story-telling. The only significant relationship between Perspective-Taking Humor and Story Perspective-Taking Humor was found among males low in trait-cheerfulness, and this relationship was negative.

While both the Perspective-Taking Humor Scale and the Aggressive Humor scale demonstrated positive relationships that approached statistical significance with the humorousness of participants' stories, only Aggressive Humor demonstrated incremental validity when the significant Trait-Cheerfulness by Sex interaction was taken into account. Counter to expectation, the Aggressive Humor scale was not significantly related to the presence of hostile humor in participants' stories. The best predictor of hostile humor was participants' level of PA immediately following the stress-manipulation. This relationship indicated that those who reported lower levels of PA immediately following the stress-manipulation were more likely to tell stories that contained sarcastic and derogating humor.

Mood Following the Story-Telling Task (Post-Story Mood)

Table 24 presents the descriptive statistics for the post-story mood variables and the mean changes in mood from immediately following the stress manipulation (post-stress) to immediately following the story-telling task (post-story). These analyses indicate that males reported significantly greater NA than females following the story-telling task, but did not differ from females with respect to the level of PA reported at that time.

Table 24: Descriptive Statistics for Post-Story Mood and mean mood change from Post-Stress to Post-Story.

		Mean	SD	t
Post-Story NA	Total (n=63)	15.29	4.71	
	Males (n=31)	16.51	5.27	
	Females (n=32)	14.09	3.81	2.10*
Post-Story PA	Total (n=63)	25.41	7.80	
	Males (n=31)	27.07	8.78	
	Females (n=33)	23.85	6.51	1.66
Post-Stress NA - Post-Story NA	Total (n=63)	-.03	4.69	-.05
	Males (n=31)	.16	5.52	.16
	Females (n=32)	-.22	3.80	-.33
Post-Stress PA - Post-Story PA	Total (n=63)	1.92	4.87	3.12**
	Males (n=31)	1.45	5.37	1.51
	Females (n=33)	2.36	4.39	3.09**

Note: *p<.05, **p<.01

With respect to change in mood following the story-telling task, the results of paired t-tests conducted among the total sample indicated that reports of NA did not change significantly but that reports of PA from post-stress to post-story significantly decreased. The same analyses conducted among males and females separately indicated that this decrease in PA was only significant among females.

Predicting Post-Story Mood

Perspective-Taking Humor, the CHS and the SHRQ were all expected to predict positive outcomes for both males and females with respect to mood in response to the story-telling task. Perspective-Taking Humor, the CHS and the SHRQ were expected to be positively related to reports of PA and negatively related to reports of NA following the story-telling task after similar reports obtained following the stress-

manipulation were statistically controlled. If found to be a significant predictor of mood, it was expected that higher scores on Aggressive Humor would be associated with worsened mood in response to the story-telling task.

Table 25: Correlations of measures of humor and trait-cheerfulness with residualized NA and PA following the story-telling task

		Residualized Post-Story NA	Residualized Post-Story PA
Perspective-Taking Humor	Total (n)	-.10(62)	.27*(63)
	Males (n)	.04(30)	.26(30)
	Females (n)	-.22(32)	.32@(33)
Aggressive Humor	Total (n)	-.06(62)	-.15(63)
	Males (n)	-.11(30)	-.08(30)
	Females (n)	.02(32)	-.24(33)
Avoidant Humor	Total (n)	-.10(62)	.13(63)
	Males (n)	.02(30)	.08(30)
	Females (n)	-.32@(32)	.18(33)
CHS	Total (n)	-.23@(61)	.25*(62)
	Males (n)	-.09(30)	.25(30)
	Females (n)	-.48**(31)	.25(32)
SHRQ	Total (n)	-.26*(63)	.39**(64)
	Males (n)	-.09(31)	.14(31)
	Females (n)	-.51**(32)	.54**(33)
Trait-Cheerfulness	Total (n)	-.16(63)	.11(64)
	Males (n)	-.11(31)	.17(31)
	Females (n)	-.21(32)	.06(33)

Note: @p<.10, *p<.05, **p<.01

As indicated in Table 25, our primary hypotheses regarding the relationships of Perspective-Taking Humor, the CHS and the SHRQ to residualized post-story mood were partially supported. Higher scores on the Perspective-Taking Humor scale, the CHS and the SHRQ were all associated with higher levels of PA in response to the story-telling task.

In addition, the SHRQ was found to be a significant negative predictor of residualized post-story NA; a similar relationship with residualized post-story NA that approached significance was also found with the CHS. There were no significant sex-differences in the relationship of the humor scales to residualized post-story mood.

The influence of Trait-Cheerfulness on the relationship between humor and post-story mood.

The significant relationships found between the humor measures and indices of mood in response to the story-telling task were re-examined in order to determine the extent to which they accounted for unique variance after that attributed to trait-cheerfulness was taken into account. In each regression analysis, post-stress PA was entered on Step 1, followed by Trait-Cheerfulness on Step 2, and the humor measure of interest on Step 3. The results of these analyses indicated that Perspective-Taking Humor and the SHRQ accounted for a significant amount of unique variance in PA in response to the story telling task [R^2Change (Perspective-Taking Humor) = .02, p =.05; R^2Change (SHRQ) = .06, p<.01]; the amount of unique variance in this outcome measure attributed to the CHS was marginally significant [R^2Change = .02, p<.10]. The SHRQ did not account for a significant amount of unique variance in the prediction of NA in response to the story-telling task.

Summary

The Perspective-Taking Humor scale, the SHRQ and the CHS were all significant predictors of improved mood following the story-telling task. However, only Perspective-Taking Humor and the SHRQ were unique predictors of mood after the variance attributed to cheerful temperament was taken into account, and this was only found in the prediction of PA. A significant negative association between the SHRQ

and NA following the story-telling task was found, but this relationship largely reflected the influence of trait-cheerfulness.

Examining predictors of improved PA in response to the story-telling task.

As indicated in Table 24 (pp. 127), the mean response to the story-telling task was decreased rather than increased PA. This was particularly true among females. While the results of correlational analyses indicated that those with higher Perspective-Taking Humor and SHRQ scores reported significantly higher levels of PA compared to their lower scoring counterparts, they do not clearly indicate that these individuals were more likely to report improved mood in response to the story-telling exercise. In order to investigate this question, participants were categorized into three groups: those who reported increased levels of PA [N= 20; n (males) = 13; n (females) = 7]; those who reported no change in PA [N= 4; n (males) = 2; n (females) = 2]; and those who reported decreased PA [N=39; n (males) = 15; n (females) = 23] in response to telling a humorous story about their lab experience. A Oneway Analysis of Variance was then performed using each of the humor measures and trait-cheerfulness as dependent variables.

The results of these analyses indicated that only mean scores on the Perspective-Taking Humor scale [$F(2,60) = 3.47$, $p<.05$] and the SHRQ [$F(2,61) = 3.62$, $p<.05$] differed significantly among the three groups. Post-hoc tests, using the Games-Howell procedure (which controls for unequal sample sizes among groups) indicated a trend for higher Perspective-Taking Humor scores among individuals who reported improved vs. worsened PA [$p<.10$] and significant differences in SHRQ scores among these two groups [$p<.05$], with higher SHRQ scores among those who reported improved mood.

Investigation of sex-differences, indicated that males were more likely than females to report improved mood following the story-telling task. However, ANOVA analyses conducted among males and females separately indicated that males' scores on the humor measures did not differ significantly between the groups. Such differences were only found among females. These results indicated that females who reported improved PA in response to the story-telling task had significantly higher scores on the Perspective-Taking

Humor scale and the SHRQ [for both scales, $p < .05$] than females who reported decreased levels of PA after telling a humorous story about their lab experience.

DISCUSSION

The purpose of this study was to evaluate the validity of the WUHI scales, the CHS and the SHRQ by investigating their ability to predict behaviour and mood during and following a potentially stressful event created in the lab. This was studied in the context of individual differences such as sex, and temperament; in some cases, level of performance on the stress tasks was also considered. The failure situation with which participants were required to cope was designed to elicit perspective-taking humor, that is the ability to see a potentially stressful situation, and one's short-comings from a humorous perspective. It was therefore expected that measures of the use of perspective-taking humor for coping (i.e., the WUHI Perspective-Taking Humor scale, the CHS and the SHRQ) would positively predict demonstrations of genuine humor during and improved mood immediately after the stress manipulation. These measures were also expected to demonstrate incremental validity in the prediction of these criteria over and above the variance attributable to cheerful temperament. Following the stress manipulation, participants completed a story-telling task, which essentially assessed their ability to engage in perspective-taking humor in the aftermath of a potentially stressful event. Measures of perspective-taking humor during this phase of the study were expected to positively predict the extent to which participants made use of perspective-taking humor in their accounts, the humorousness of their stories, and improved mood following the exercise. Again, in order to support the distinction of these humor measures as indices of a cognitive coping strategy rather than of cheerful temperament, measures of the extent to which individuals use perspective-taking humor for coping with stress were expected to account for significant additional variance in the prediction of these criteria over and above trait-cheerfulness.

The validity of the WUHI Perspective-Taking Humor Scale

Consistent with the results of Study 2, evidence supporting the validity of the Perspective-Taking Humor scale was stronger for females than it was for males. Although only a trend, Perspective-Taking Humor was also associated with the humorousness of participants' stories, indicating that both males and females who report a greater tendency to use humor for coping in this manner demonstrate greater competence in telling humorous stories about their stressful experiences. As expected, individuals who, on the Perspective-Taking Humor scale, reported a greater tendency to engage in and benefit from humorous story-telling about past stressful events were more likely to report better mood from using this coping strategy in the lab than those less inclined to use humor for coping in this manner. These relative benefits for PA following the story-telling task that were found to be associated with higher scores on the Perspective-Taking Humor scale were neither better accounted for nor dependent on trait-cheerfulness or the sex of the participant. However, closer examination of humor scores among those whose mood actually improved in response to the story-telling task indicated that significantly higher Perspective-Taking Humor scores were only found among females who reported improved versus worsened PA. Males were more likely than females to report improved PA after telling a humorous story about their lab experience, regardless of their scores on the Perspective-Taking Humor scale. In other words, compared to males, females' response to telling a humorous story about a stressful experience in the lab was more consistent with their report of the extent to which they use this coping strategy in their daily lives.

Evidence for the predictive validity of the Perspective-Taking Humor scale also differed between the sexes in the prediction of articulated perspective-taking humor during the stress manipulation and in their stories. Although no sex-differences were found in the nature or magnitude of the relationships between the Perspective-Taking Humor

scale and humorous comments during the stress manipulation, the Perspective-Taking Humor scale was a unique predictor of this behaviour for females, but not for males. In fact, WUHI measures of humor and trait-cheerfulness were essentially equal in the prediction of comments reflecting perspective-taking humor among males. Thus, whether or not males made humorous comments about themselves and/or the absurdity of the lab situation was predictable from the extent to which they reported enjoying and/or engaging in any kind of humor. The nature of the three-way interaction between Perspective-Taking Humor, Trait-Cheerfulness and Sex in the prediction of perspective-taking humor in stories indicated that the Perspective-Taking Humor scale was a weak predictor of this behaviour among females, and did not vary as a function of temperament. Among males, however, the validity of Perspective-Taking Humor for this criterion was dependent on trait-cheerfulness and was clearly not supported for males low in this trait.

The sex-differences found in the predictive validity of Perspective-Taking Humor have implications for the assessment of this behaviour for males and females. The unique ability of the Perspective-Taking Humor scale to predict females' humorous comments during the stress manipulation suggests that predicting such behaviour among females requires measures that target the creation of perspective-taking humor for coping with stress. Predicting the same behaviour for males does not require the same degree of specificity. This may explain the sex-differences found in our pilot research. The results of our pilot study indicated that the CHS and the SHRQ were significantly related to the humorousness of males' quips in response to narratives of potentially embarrassing situations, but were essentially unrelated to the same criterion among females. Assuming that competence in producing humor in response to a stressor is related to the frequency with which individuals engage in such behaviour, we initially interpreted these findings as indicating that making humorous comments during a stressful

situation was not characteristic of female coping humor. The results of the current study clearly indicate that this is not the case. Females do make humorous comments in response to stress. However, predicting such behaviour requires measures that are specific in targeting perspective-taking humor for coping. The reason the CHS and the SHRQ failed to be significant predictors of the humorousness of females' quips in the pilot study is likely due to their lack of specific focus on sharing humorous talk about personal short-comings and life's absurdities. The comparatively low specificity of the CHS and the SHRQ for assessing the extent to which individuals create perspective-taking humor in response to stressful life events likely also accounts for their inability to contribute to the prediction of humor behaviour in this study after the variance attributed to cheerful-temperament was taken into account.

The validity of the WUHI Aggressive Humor Scale

Contrary to hypotheses, but consistent with the results of Study 2, the Aggressive Humor scale of the WUHI was not a significant predictor of mood; findings regarding its predictive value were largely limited to its relationships with indices of humor behaviour. As expected, Aggressive Humor was a significant predictor of the humorousness of participants' stories. In fact, this measure, which assesses the extent to which individuals use wit and make fun of others as a means of coping with stressful events, was the strongest predictor of competence in creating humor. However, contrary to expectation, Aggressive Humor was not a significant predictor of the style of humor it describes. Moreover, this measure, which was not expected to predict signs of genuine humor, proved to be a predictor of genuine smiling and laughter during the stress-manipulation. The relationship between Aggressive Humor and humor displays was particularly strong among males. However, Aggressive Humor predicted genuine smiling for both males

and females if they performed poorly on the challenging tasks. Aggressive Humor was also a significant predictor of laughter among males, once the variance attributable to performance on the stress tasks was statistically controlled.

The lack of significant relationships between WUHI-Aggressive Humor and this style of humor content may have been due to the rarity of this behaviour, which makes it difficult to evaluate the meaning of these null findings. However, the positive relationships between Aggressive Humor scores and affective displays of genuine humor may be important for understanding the function of this behaviour for coping with an immediate stressor. These findings might indicate that individuals who use hostile humor as a means of coping were more likely to smile and/or laugh in order to regain a sense of mastery after they failed to perform well on the stress tasks. A number of theorists have described laughter as an expression of mastery. For example, Lefcourt and Martin (1984) quote Hayworth (1928) as describing laughter in response to threat as an expression of an "aggressive, conquering attitude". Similarly, Levine (1977) theorized that smiles and laughter originally arise in children in response to successful attempts at mastery over problematic circumstances. According to Levine's theory, smiles and laughter eventually become associated with threat. When new threats are encountered, smiles and laughter occur in an attempt to regain previous feelings of mastery. The Aggressive Humor scale describes the use of humor as a means of affirming to the self and asserting to others one's dominance in response to interpersonal stresses that threaten self-esteem. This is consistent with the conceptualization of laughter in the face of threat as a demonstration of 'superiority humor.'

The stronger relationship found between Aggressive Humor and laughter among males compared to females is consistent with the findings of Martin and Kuiper (1999), a diary study that examined the correlates of naturally occurring daily laughter. They found that

measures of Type A personality, which is characterized by higher levels of aggression, competitiveness, and dominance, were positively associated with laughter among males but were either negatively related or unrelated to laughter among females. That Aggressive Humor was a stronger positive predictor of laughter among males than females may have been further influenced by the threats to self-image and social demands associated with failing in front of a member of the opposite sex. Males generally reported higher levels of negative affect or arousal in response to the stress manipulation than did females, which might have been a reaction to a situation they experienced as 'emasculating.' While males with higher scores on Aggressive Humor may have been more prone than those with lower scores to engage in 'put down' humor in response to these feelings, the pressures they likely experienced to be polite, particularly in front of a female, may have inhibited such behaviour. Thus, rather than explicit verbal expressions of hostile humor, high WUHI-Aggressive Humor males laughed possibly as a way of communicating their superiority. Future studies should manipulate experimenter characteristics such as sex and status (e.g., a same-age peer vs. graduate student), in order to further understanding of the conditions under which Aggressive Humor is most likely to predict laughter as well as hostile humorous comments as a means of coping with stress.

The validity of the WUHI Avoidant Humor Scale

As with Aggressive Humor, the Avoidant Humor scale was not expected to be a strong predictor of many of the criteria of interest in this study. But, in contrast to the other humor scales, the pattern of findings associated with Avoidant Humor was most consistent with hypotheses. Predictions regarding the relationship of Avoidant Humor to reports of NA and PA in response to the stress manipulation were confirmed. Consistent with the results of Study 2, Avoidant Humor was significantly and positively related to increased NA in response to the stress

manipulation and the magnitude of this relationship was stronger for males than it was for females. Avoidant Humor also predicted decreased PA in response to the stress manipulation, particularly among those who performed relatively well on the stress tasks.

It is not clear whether the worsened mood reported by people who obtained higher scores on Avoidant Humor was due to their attempts to engage in this kind of humor behaviour during the stress manipulation or because the competing demands for their attention prevented them from making use of this preferred way of coping. Regardless of the cause, it is clear that reports of a tendency to use humor in order to distract one's self and/or others from current stresses are predictive of poorer adjustment to situations that call for problem-focused coping, particularly for males. The fact that the CHS and the SHRQ demonstrated a pattern of results similar to that found with Avoidant Humor in the prediction of PA may be due to the implied focus common to all three of these measures on the use of humor during stressful events.

Clinical Implications

The results of this study have a number of implications for the assessment of humor in response to stress and its potential utility as a coping strategy. As previously mentioned, the unique power of the Perspective-Taking Humor scale to predict females' humorous comments during the stress manipulation, as well as the greater power of the WUHI scales, compared to the CHS and the SHRQ, to predict humor behaviour over and above that attributable to trait-cheerfulness, speaks to the importance of assessing different forms of humor in tools designed to measure the use of humor for coping with stress.

The results also speak to the usefulness of including measures of trait-cheerfulness along with measures of humor in the prediction of humor behaviour and moods in response to stress. Doing so in this study

allowed us to demonstrate the incremental validity, and hence utility, of the WUHI scales over and above trait-cheerfulness. The results found with trait-cheerfulness versus measures of the use of humor as a coping strategy also suggested that different outcomes in response to stress might be attributable to different processes. The fact that the Perspective-Taking Humor scale was a unique predictor of females' humorous comments during the stress manipulation, but was essentially equal to other humor measures and Trait-Cheerfulness in the prediction of humorous commentaries among males, suggests that females' humorous comments in the face of stress are more likely to indicate coping; the same behaviour demonstrated by males is more likely indicative of a cheerful disposition than it is a deliberate attempt to cope with a current stressor. Similarly, the fact that Aggressive Humor predicted genuine laughter among males is suggestive of a coping process. In contrast, the fact that female laughter among those who performed poorly on the stress tasks was predicted by Trait-Cheerfulness suggests that female laughter under these circumstances was a better indicator of lower emotional reactivity and greater maintenance of good humor under stress than of a conscious attempt to cope with the stressor at hand.

The results of analyses investigating the relationships of humor and trait-cheerfulness to indices of mood in response to the stress manipulation and the story-telling task also suggest potential limitations and benefits of the use of humor as a coping strategy. The relationship of the Perspective-Taking Humor scale to indices of behaviour and mood suggests that individuals who report greater use of this coping strategy are likely to make humorous comments about themselves and/or the absurdity of their present circumstances during a stressful event. However, such persons do not necessarily experience better mood immediately following stressful events than others less likely to cope in this manner. In fact, our results suggest that people who maintain humor

during stress likely do so, not because of any active or conscious attempts on their part to humorously reframe the situation, but because of their temperament. It is their cheerful temperament that "buffers" them from experiencing mood disturbance. This finding, combined with the lack of beneficial outcomes found to be associated with humor, leads us to surmise that teaching people to use humor to cope during acutely stressful events may be a misdirected effort.

Measures of perspective-taking humor were stronger predictors of benefits for mood following the story-telling task than in response to the stress manipulation. Consistent with hypotheses, the Perspective-Taking Humor scale, the CHS and the SHRQ were all significant positive predictors of relatively better PA from completion of the stress-manipulation to completion of the story-telling task. It is not surprising that self-reports of the extent to which individuals engage in and benefit from telling humorous stories about experiences once perceived as stressful were positively associated with relative benefits for mood following the story-telling task. These results not only support the construct validity of the Perspective-Taking Humor scale as a measure of the use of humor for coping, but also suggest that at least the process of reframing a stressful experience as humorous after it has occurred is a coping strategy from which both males and females may benefit. The fact that benefits for mood found to be associated with measures of perspective-taking humor were limited to the story-telling task, further suggests that the use of humor as a coping strategy may function best to prevent individuals from becoming depressed in the aftermath of stressful events.

Limitations and future directions

Whether or not males and females are likely to benefit equally from sharing humorous stories about past stressful events with others is an empirical question that remains to be tested. Presumably, the

potential success of attempts to cope with past stressors by sharing humorous stories about them is limited by the audience's response. Lampert and Ervin-Tripp's field studies of the use of humor shared by males and females in naturally occurring contexts (Lampert & Ervin-Tripp, 1998) suggest that the type of humorous story told and the likelihood of it being well received depends on the sex of the speaker as well as the characteristics of the audience. Furthermore, research by Ruch and his colleagues suggest that the individual's reaction to feedback from the audience (be it positive or negative) is likely to be influenced by temperament. For example, given their higher threshold for negative affect, highly cheerful individuals would be expected to be less likely to become distressed in response to a failed attempt to make others laugh than less cheerful individuals. For individuals lower in trait-cheerfulness, a failed attempt to make others laugh in response to a story about a past stressful event may exacerbate the negative impact of the recalled stressor. It is also not clear whether the improved PA in response to the story-telling task associated with higher scores on measures of perspective-taking humor reflect the influence of telling a humorous story or of telling any kind of story about their experience in the lab. Future studies should manipulate the type of story told following a stressful event in order to better discern whether the benefits associated with scores on perspective-taking humor measures are specific to the process of humorously reframing an event.

Although suggestive, the small effects for humor in the prediction of mood ratings make it difficult to estimate the potential importance of humor measures for predicting outcomes in response to stress. The small sample size likely limited our statistical power, and in turn, our ability to accurately estimate the magnitude of the relationships of interest. The number of analyses conducted at the $p = .05$ level also increased the probability of Type I errors. Hence, some of the relationships reported might be spurious. Certainly, replication of the results found in this

study among a larger sample is needed.

Estimating the importance of humor in the prediction of mood outcomes in this study may have also been limited by the nature of the potentially stressful situation with which participants were required to cope. The stress manipulation did succeed in causing mood disturbance. However, examination of the mean levels of negative and positive affect reported following this experience indicate that the stress induced by the manipulation was mild. It is possible that measures of the use of humor for coping would demonstrate stronger relationships to mood outcomes under conditions involving higher levels of stress. Given the ethical limitations inherent in inducing high levels of stress in human participants, the logical choice for further evaluation of the predictive importance of the WUHI scales would be to deploy them among populations that are naturally prone to high levels of stress due to their occupation (e.g., paramedics, policemen, emergency room physicians and nurses) or life circumstances (e.g., individuals living with chronic physical diseases).

Another limitation of the present study is the absence of a low stress control condition. Inclusion of a low stress control condition would provide a clearer indication of the extent to which the WUHI scales assessed coping. In such a design, measures of the use of humor for coping would only be expected to predict humor behaviour and mood under high stress conditions, whereas measures of cheerfulness would significantly predict humor behaviour and mood across conditions. Although not as elegant, there are aspects of this study that can partially address the problems raised by the lack of inclusion of a low stress control. Including a measure of cheerful temperament allowed us to test the incremental validity of the WUHI scales. As discussed previously, the WUHI scales were found to be distinct from trait-cheerfulness in the prediction of the dependent variables. Secondly, in contrast to trait-cheerfulness, the CHS and the SHRQ, none of the WUHI scales were

significantly related to mood ratings obtained before the stress manipulation. That the WUHI scales were not significant predictors of mood during this period of relatively low stress provides preliminary evidence that the predictive value of the WUHI scales is likely limited to situations where coping is relevant (i.e., under stressful conditions).

GENERAL DISCUSSION

This work documents the development of a new measure designed to comprehensively assess ways of using humor for coping with stress. In contrast to the CHS, the WUHI was developed to not only identify those most likely to use humor to cope, but to assess how they do it. Also unique to the WUHI is its inclusion of scale items that describe ways of using humor that are thought to be health-enhancing as well as those that have often been assumed to have limited benefits for coping with stress.

Evaluation of the WUHI scales

Overall, the results suggest that the WUHI holds promise as a tool for the investigation of the use of humor as a coping strategy. It proved to have solid psychometric properties. Confirmatory factor analyses indicated that the three-factor solution representing Perspective-Taking Humor, Aggressive Humor and Avoidant Humor is replicable among both males and females. Responses on each of these scales also demonstrated high internal consistency, stability, and were not influenced by social desirability.

A two-pronged approach was taken to evaluate the validity of the WUHI scales. Study 2 examined the validity of the WUHI in relation to previously established measures of coping and personality, and Study 3 investigated the ability of the WUHI to predict behaviour and moods in response to a potentially stressful situation created in the lab. The preliminary evidence resulting from this work is favourable. For the most part, the pattern of associations found with each WUHI scale across studies was unique and predictable based on theoretical considerations. The WUHI scales also proved to be distinct from a measure of cheerful temperament in the prediction of outcomes in response to stress, hence providing support for their incremental validity and potential utility as predictors of behaviour and moods in situations where coping is relevant.

Having stated this, evidence supporting the validity of the WUHI was greater for some of the subscales than for others. This can be attributed, in part, to our particular interest in humor's potential health-enhancing qualities. This focus influenced our decision to create a lab situation that elicited perspective-taking humor, as it is this kind of humor that has been thought to procure the greatest benefits for coping with stress. Thus, while the design of the lab study provided opportunity to evaluate the construct and discriminant validity of the Perspective-Taking Humor scale, it also limited opportunities to thoroughly evaluate the validity of Aggressive Humor and Avoidant Humor. Investigation of sex-differences in the relationships of the WUHI to the criteria of interest also suggested limitations in the generalizability of some of the scales. While such differences complicate conclusions about scale validity, they raise interesting issues relevant to studying the use of humor as a coping strategy.

WUHI Perspective-Taking Humor

The majority of the evidence obtained thus far suggests that the Perspective-Taking Humor scale holds greater promise for females than it does for males. The results indicate that females who obtain high scores on this scale describe themselves as extraverted, prone to experiencing positive affect and well-being. They are likely to report an interest in playing with ideas, and to seek social support in response to stress. The Perspective-Taking Humor scale was also a unique predictor of females' spontaneous humorous comments about themselves and/or the tasks during the stress manipulation, and reports of increased positive affect after telling a humorous story about the experience. Although not statistically significant, there was a trend indicating that females with higher scores on Perspective-Taking Humor were more competent in telling a humorous story about their experience in the lab.

Males' Perspective-Taking Humor scores demonstrated similar predictive relationships with indices of extraversion, social support

seeking, humorous comments during the stress manipulation, and the humorousness of their stories. However, in contrast to females, males' scores on the Perspective-Taking Humor scale did not distinguish those who reported improved versus worsened PA in response to the story-telling exercise. Also, males Perspective-Taking Humor scores did not demonstrate the same degree of convergent validity with measures of personality, nor did they consistently demonstrate discriminant validity from other measures of humor and personality in predicting behaviour. In Study 2, the failure of males' Perspective-Taking Humor scores to positively predict personality traits indicative of an interest in playing with ideas, and a warm and friendly interpersonal style provided the first indication that this humor scale may not be a valid measure of the extent to which males use perspective-taking humor to cope with stress. The validity of Perspective-Taking Humor for males was further brought into question by findings in Study 3, which indicated that the power of this measure to predict males' demonstration of perspective-taking humor in the lab was either redundant with or dependent on Trait-Cheerfulness. The moderated relationship of Perspective-Taking Humor to demonstrations of this kind of humor in males' stories, suggested that this humor scale was invalid for cheerless males.

The reason for differing levels of evidence supporting the validity of the Perspective-Taking Humor scale between the sexes is difficult to determine. However, this pattern of results might indicate that there are more factors that influence the extent to which males use adverse circumstances, particularly those that bring attention to their own short-comings, as content for humor. The extent to which males demonstrate perspective-taking humor in any given situation may reflect an effort to cope with negative affect. Alternatively, it may simply be indicative of a cheerful and socially competent male. In the latter case, males' demonstration of perspective-taking humor in Study 3 might reflect a desire to be perceived as friendly and attractive by a member of the

opposite sex. For females however, the results seem to more clearly suggest the use of perspective-taking humor as a means of coping with adversity. Whether this same pattern would hold in a social context requiring interaction with a male rather than a female is an empirical question requiring further study.

The WUHI Aggressive Humor scale

Of the WUHI scales, the results provided the weakest validational support for Aggressive Humor. As expected, the Aggressive Humor scale demonstrated convergent validity with measures of personality and coping which suggest that individuals with high Aggressive Humor scores have a tendency to be interpersonally hostile, to vent negative emotion and to exercise less prudence when attempting to cope with stress. Also as expected, Aggressive Humor, which describes using wit and making fun of others in response to threat, was a significant predictor of competence in creating a humorous story about the lab experience. In spite of these findings, Aggressive Humor failed to predict the demonstration of hostile humor in the lab. In fact, contrary to expectation, Aggressive Humor predicted genuine laughter among males and genuine smiling among males and females during the stress manipulation. As previously discussed, the association of Aggressive Humor to indices of humor behaviour in the lab might have been influenced by social demand characteristics. However, even if this was the case, the consistently weak relationship of the Aggressive Humor scale to established measures of the use of humor for coping, to traits predictive of adjustment in response to stress (i.e, neuroticism and extraversion) and to self-reports of moods in Study 3 suggest that the extent to which individuals engage in this behaviour may have little relevance to their adjustment to stress.

The WUHI Avoidant Humor scale

The relationship of Avoidant Humor to indices of coping was consistent with hypotheses. As expected, Avoidant Humor was a significant predictor of self-report measures of avoidant coping styles, such as denial and mental disengagement (i.e., distraction). Consistent with theoretical considerations regarding its incompatibility for coping with the situation in the lab, Avoidant Humor predicted greater mood disturbance in response to the stress manipulation, and was not a significant predictor of behaviour and moods in response to the story-telling task.

Sex-differences in the correlates of Avoidant Humor were not anticipated but were remarkably consistent across the two validation studies. The positive relationship between Avoidant Humor and Neuroticism found only among males was mirrored in the lab study by a similar relationship between males' Avoidant Humor scores and reports of negative affect in response to the stress manipulation. In addition, while males' Avoidant Humor scores in Study 3 were associated with disturbances in both negative and positive affect, females' scores were only associated with disturbances in positive affect. Clearly, a tendency to use humor to cope in this manner was associated with worse outcomes for males than for females. That males' Avoidant Humor scores predicted Neuroticism also suggests that the tendency to think of funny things and make jokes in order to distract one's self and others from immediate stresses is indicative of generally poor coping, which is not limited to the particular lab circumstances.

It could be argued that the relationship between males' Avoidant Humor scores to Neuroticism and negative affect in the lab are spurious, reflecting the influence of method variance due to the heavy weighting of this scale on using humor to cope with anxiety and distress (Clark & Watson, 1995; Watson & Hubbard, 1996). However, there is no reason

to expect that this potential confound should exist exclusively for males, and hence is not a likely explanation for such differences in the association of the Avoidant Humor scale to dispositional and situational indices of adjustment. The differential relationship between the sexes of Avoidant Humor to Openness to Experience is likely of greater relevance to understanding the poorer outcomes associated with males' scores on this scale. Avoidant Humor was positively related to Openness to Experience for females, but negatively related to this personality trait for males. Thus, it may be that while males and females do not differ in the extent to which they use this strategy, males may apply it in a less flexible manner than do females. The poorer outcomes associated with males Avoidant Humor scores might therefore reflect a greater tendency to joke and think of funny things in situations where such behaviour is inappropriate.

Discriminant Validity of the WUHI scales

The issue of discriminant validity is worthy of further comment, particularly with respect to the Perspective-Taking Humor and Avoidant Humor scales. The correlations between these humor measures were consistently high (r's ranging between .49 and .63). Also, while differences were found with respect to the statistical significance of their relationships to criteria of interest, the pattern of associations found with these humor measures were often similar. In order to address questions about discriminant validity, the results of analyses were reexamined to determine whether the two scales significantly differed from each other in predicting validity criteria.

The majority of the evidence obtained from this reexamination suggested that our treatment of the Perspective-Taking Humor and Avoidant Humor scales as separate scales was justified, but more so for females than for males. The relationships of the Perspective-Taking Humor scale and the Avoidant Humor scale to the Big Five personality

traits did not significantly differ from each other. However, evaluation of the humor scales to differentially predict dispositional coping styles as assessed by the COPE, indicated that the Perspective-Taking Humor scale was a significantly stronger predictor of a tendency to seek Emotional Social Support (see Discussion pp.68). By contrast, Avoidant Humor was a significantly stronger predictor of other avoidant coping styles, such as Mental Disengagement (see Discussion pp. 68), Denial [t (172) = -2.88, p<.01] , and Restraint [t(172) = -3.60, p<.001].

Sex-differences in the discriminant validity of the Perspective-Taking Humor and Avoidant Humor scales were evident in Study 3. As previously noted, Perspective-Taking Humor was a unique predictor of females' humorous comments during the stress manipulation, but was equivalent to other humor measures and trait-cheerfulness in predicting the same behaviour among males. Similarly, this humor measure was significantly better than Avoidant Humor at predicting the humorousness of females' stories [t(28) = 2.49, p<.01], but was not distinct from Avoidant Humor in predicting males' competence in telling a humorous story about their lab experience. With respect to mood, only females' scores on Perspective-Taking Humor and Avoidant Humor differed significantly from each other in predicting NA in response to the stress manipulation [t(30) = 2.37, p<.05]. In addition, only females' Perspective-Taking Humor scores proved to be significantly better predictors than their scores on Avoidant Humor of improved PA in response to the story-telling task. This was determined by entering both humor measures together as predictors in a regression analysis predicting improved rather than consistent or worsened PA in response to the story-telling task. The results indicated that the Perspective-Taking Humor scale was the strongest and only significant predictor of improved PA for females [b = -.06, t(30) = -2.31, p<.05], but was not significantly better than Avoidant Humor in predicting the extent to which males' PA improved in response to this exercise (all p's > .25).

Although more favourable for females than for males, the fair degree of overlap of the scales suggests the need for further refinement of the WUHI. One way to achieve greater distinction between the scales would be to examine all item-total correlations and eliminate and/or rewrite items that were substantially correlated with more than one scale. Obtaining examples from respondents for each of the scale items might also help clarify whether they indeed refer to behaviours consistent with the constructs the WUHI scales were designed to measure.

The CHS and SHRQ

In his review of a decade of findings with the SHRQ and CHS, Martin concludes that the "SHRQ assesses primarily the expression of mirth in extraverted individuals", whereas "the CHS seems to be best viewed as a narrow measure of the degree to which individuals make use of humor in coping with stressful events, rather than as a general measure of the sense of humor" (pp. 270, Martin, 1996). In Study 3, the redundancy of the SHRQ with Trait-Cheerfulness in predicting humor behaviour is consistent with Martin's conceptualization of this measure. However, the results of Study 3 suggest that the CHS is a broader measure of sense of humor than was previously thought. The CHS also proved redundant with cheerfulness in the prediction of humor behaviour. But in addition, its relationship to reports of PA in response to the stress-manipulation and story-telling task paralleled those found with Avoidant Humor and Perspective-Taking Humor, respectively. Hence, it would appear that the CHS measures many aspects of the humor construct relevant to adjustment – cheerful temperament and ways of using humor to cope.

The apparent breadth of scope of the CHS in its measurement of the humor construct may explain why it has demonstrated both moderator and main effects in the prediction of adjustment to stress. However, even when evidence for stress moderation is found, it is

difficult to determine whether it reflects the influence of a cheerful temperament or the use of humor as a coping strategy. As was shown in this work, measures such as the STCI-T<60> Trait-Cheerfulness scale can be helpful in clarifying such issues. It is hoped that in addition to measures of temperament, continued use of the WUHI in future research will assist in furthering understanding of the processes involved in humor's function for adaptation to stress.

Sex-differences

Observations in the literature regarding sex-differences in the correlates of the CHS provided the impetus to examine more closely the meaning of coping humor for males and females. Given the literature indicating sex-differences in humor appreciation, we hypothesized that negative outcomes found to be associated with males' CHS scores in some studies reflected their tendency to make jokes that disparage others in response to stress. The more favourable outcomes found to be associated with females' CHS scores were hypothesized to reflect their greater tendency to tell humorous, self-deprecating stories about stressful experiences.

Contrary to our initial hypotheses, little evidence was found to suggest that males and females engage in different humor behaviours in response to stress. Statistically significant sex-differences in mean scores on the WUHI Perspective-Taking Humor and Aggressive Humor scales were found. As expected, females reported greater use of humorous story-telling and self-deprecating humor as a means of coping, whereas males reported a greater tendency to make fun of others in response to threat. However, these differences were found among a very large sample (n = 574), using a very powerful statistical test; the same tests performed among more modest samples (n = 192) failed to reveal statistically significant differences. Therefore, it appears that sex-differences found in the large sample, although statistically significant

are small and not very meaningful. Also consistent with hypotheses, Aggressive Humor was more strongly associated with the CHS for males than for females. While this finding suggests that coping humor for males is more likely to include the use of hostile humor, the inability of Aggressive Humor to predict indices of adjustment also suggests that the extent to which males use this strategy cannot explain the negative outcomes associated with males' CHS scores that were previously reported in the literature.

Rather than indicating differences in the kind of humor behaviour used by males and females for coping, the results of this work suggest that the sensitivity of humor measures for predicting humor behaviour varies as a function of sex. For example, Perspective-Taking Humor proved to be a more sensitive measure than the CHS for predicting females' humorous comments during the stress-manipulation. For males, however, the CHS, Perspective-Taking Humor and other measure of humor and cheerfulness were equally strong predictors of this behaviour. As previously discussed, there is also some suggestion that males and females may differ in the manner with which they apply some ways of using humor to cope (e.g., Avoidant Humor), and this may be relevant to understanding differential outcomes in response to stress.

Concluding Comment

Amid the many and sometimes confusing findings described here, one clear conclusion is that coping humor is a complex phenomenon. The studies documenting the development and validation of the WUHI confirmed that 'coping humor' has many meanings for males and females. These studies also demonstrated that sex, temperament, and situational factors are all important for understanding the potential benefits and limitations of humor for coping with stress.

Besides the WUHI itself, there are a number of aspects of this work that we hope will be received as a contribution to the literature.

First, was the recognition that not all ways of using humor facilitate positive adjustment and second was the conceptual distinction of humor as a skill from that of a habitual behavioural style. These issues have previously been raised as problems in the humor literature, but to our knowledge, this was the first time that both of them were integrated in the study of humor's function as a moderator of stress. It is also hoped that others benefit from the methods described for observing humor. Direct observation of humor is challenging, but in our view, necessary for evaluating the validity of tools purporting to measure humor as a coping strategy.

In addition to benefiting from its strengths, we hope that future investigations will continue to build upon this work, seeking answers to the number of questions that remain unaddressed. Most noteworthy is the need for experimental studies in order to firmly establish the validity of the WUHI as a measure of coping, and to determine causal relationships between various ways of using humor and outcomes in response to stress. The latter is essential for developing empirically based clinical interventions, which are sorely lacking in the literature. We believe that the WUHI can help to move the literature forward in this much needed direction.

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Appendix A

Below are listed, in order, the scenes from the Quip task used in the pilot study described on pages 11-14.

1. The Dinner

You're at a formal dinner (clinking glasses and chatter in the background) hosted by the parents of your significant other who you are meeting for the first time. So far everything is going quite smoothly; you've demonstrated your impeccable manners; you have even remembered which fork to use for your salad. As you make your way through the main course you go to cut your veal and realize that you've been given a very tough piece. You start off trying to cut it as gingerly as you can but this is getting you nowhere. Now, a bit frustrated, you put a little more muscle into it and start to vigorously saw at the meat (sound effect) when, suddenly, in one swift move, you manage not only to finally cut it but at the same time end up flinging a potato from your plate onto the hostesses lap ("Oh!" female voice). With all eyes now upon you, you look up and say...

2. The "Captivating" Movie

You've just arrived in class to find out that your professor has decided to show a movie today. You are relieved because after pulling an all-nighter to study for the midterm you just wrote, the last thing you want to do is to have to concentrate and take notes. They dim the lights and start the movie. (Sound effect of a projector, sound of Lorne Green type wildlife show). At first you make a good effort to try and stay awake but with each passing moment your eyes are getting smaller and smaller until you finally just give in and fall asleep on your desk. (Snoring in the background) What seems like only a few minutes later, you awaken (yawn) from your midday slumber to find that the movie has

stopped, the lights are on, and everyone, including the professor, is staring at you with this weird look of amazement on their faces. In light of the fact that you've been known to snore quite loudly when you're really tired, you put two and two together, look to the class and say...

3. The Interview

You're waiting to go into an interview for your dream job. To ensure that you wouldn't be late you got to the office 20 mins. early, but now, with every passing minute you are feeling increasingly anxious. In order to ease your nerves you decide to help yourself to some water from the cooler. However, instead of quenching your thirst, in your nervousness you end up inadvertently spilling the entire contents of the Dixie cup in your lap. About 2 seconds later the boss finally comes out to meet you and although he is shaking your hand you can't help but notice that he is having a hard time maintaining eye contact. Realizing what he's thinking, you look up and say...

4. The Exposing Speech

You're standing giving a speech in front of a fairly large group of people. Things are going quite smoothly and you seem to have everyone's attention with the exception of a group of people down in the front row who are whispering and giggling amongst themselves (sound effect). You try to ignore them, but this group which is growing in number is starting to become a real distraction. Nevertheless, you continue, trying to remain composed, that is until you notice one of the chuckling masses pointing at you. In response, you look down, only to realize that your fly/blouse has been open the whole time, leaving very little to the imagination. Recognizing that you won't be able to continue without rectifying the situation you zip/button up, look to the audience and say...

5. The Lingering Fart

You are standing in the elevator of the high-rise apartment building that you've just moved into ("ding") when on walks one of the maintenance men who just happens to be of the hairy and sweaty variety (grunting in the background). The two of you stand there in silence staring at the numbers above the elevator doors ("ding...ding...ding"), when suddenly, like fireworks on the forth of July, (FART!) the silence is broken by the loudest, rudest fart you've ever been assaulted with. Mr. Maintenance Man, apparently unfazed by his violation of "elevator etiquette" walks off at the next floor without even batting an eye, leaving you to suffer at the mercy of his prize-winning fart. Just as you finally manage to catch your breath, ("ding") a couple of your new neighbours who happen to live on your floor, walk on. Not only do they notice the stench ("sniff, sniff") but to your horror judging by the look of sheer disgust on their faces, they think that you produced it. In an attempt to salvage your image, you look to them and say...

6. The Zit

It's the middle of the night and you wake up with a weird throbbing sensation that seems to be emanating from the end of your nose. Slightly panicked, you get out of bed and rush to the bathroom to get a better look. When you get there you find that what you feared most has happened. At the end of your nose is the biggest zit you have ever seen. You immediately grab for your super anti-zit cream, generously apply it to the area, go back to bed and hope for the best.

The next morning you wake up to find that not only has the zit not disappeared, but to your disbelief it has actually gotten bigger! You know that there is nothing you can do to cover up this sucker. You consider staying home from school but then you remember that you have to meet with one of your classmates to work on a presentation. So you get your things together and head off to face the day. On your way there,

you are wondering how you are going to get through the day and figure that your best strategy is to just forget about the zit and go about your business a usual. By the time you meet up with your classmate you have practically forgotten about the minor disfigurement to your face. That is until you notice that they do seem a bit distracted. You know that they've spotted it. You try to deflect the attention from your nose by moving your head around as you are speaking and making a lot of hand gestures around your face, but to no avail. It's like they're completely mesmerized by the protrusion at the end of your nose. In an attempt to get your meeting back on track, you stop talking about the project, look your partner dead in the face and say...

Appendix B

Content areas and original items created for the Waterloo Uses of Humor Inventory:

Perspective-Taking, Private Coping Humor, During the Event

-While I am in an irritating or awkward situation, I start thinking about how I would talk about it in a funny way

-I laugh privately to myself about my short-comings

-I try to find something to laugh at when I feel myself becoming upset

-I privately make fun of myself when I make mistakes or do something embarrassing

-When I am nervous about having to do something I try to think humorously about all the things that could possibly go wrong

-I make fun of my short-comings before anyone else can.

Aggressive, Private, Coping Humor, During the Event

-I privately laugh at people when I see them overreacting to minor things

-I privately make fun of people when they bother me

-I privately make jokes about people when I feel they are mistreating me.

-When someone is angry with me, I don't laugh out loud, but I privately make fun of their behaviour

Avoidant, Private Coping Humor, During the Event

-I try to make myself think of funny things when I find that my mind is filled with worrisome thoughts.

-I try to think of something amusing to distract myself from my own fears or worries

-Funny things occur to me when I become uncomfortable

-I change my moods at times of crisis by imagining funny things

Affiliative, Public Coping Humor, During the Event

-I tell jokes to make others laugh when I feel that a situation is getting too tense

-I tell funny stories about things that have happened to me when I'm in an awkward social situation

-Immediately after something upsetting has happened to me I tell my friends about it in a humorous way.

-I tell jokes or recount funny things I've seen on T.V. when I feel uncomfortable by a long silence in a group conversation.

Aggressive, Public Coping Humor, During the Event

-I respond to people who are insulting or rude to me by making fun of them in front of others

-I try to find something or somebody else to make fun of when I feel I have made a fool of myself

-When someone makes fun of my short-comings, I will reply by poking fun at them

-I use my wit to defend myself when I feel someone is threatening me

Avoidant, Public Coping Humor, During the Event

-I laugh out loud when someone asks me questions about things that make me anxious

-I laugh out loud when I feel nervous

-When I make a mistake or do something embarrasing, I laugh first so people will laugh with me and not at me.

-I laugh and joke as a way to avoid talking about something that is bothering me.

-Other people tell me that I make jokes or act silly to avoid dealing with serious matters

-I deal with people who are angry or upset with me by trying to make them laugh

-I act goofy and silly when someone is trying to pick a fight with me

Perspective-Taking, Private Coping Humor, After the Event

-I laugh to myself when I think of the embarrassing things I have done in the past

-I laugh to myself at my past mistakes, even though I didn't think they were amusing at the time they happened

-I am now able to see humor in events that I had once experienced as being quite distressing

Affiliative, Public Coping Humor, After the Event [2]

-I share stories about my more embarrassing moments to make people laugh

-It makes me feel better when I share stories about my past embarrassments

-I share stories about embarrassing things that have happened to me in hopes that others will tell me their embarrassing stories, and the situation won't seem as bad as I thought it was

-When others laugh in response to stories I tell about embarrassing experiences, I realize how silly it was to be upset about them in the first place.

-Telling a story about embarrassing situations that have happened to me prompts others to share embarrassing stories of their own and I realize that I am not the only one that looks foolish sometimes.

-I tell funny stories about situations that have made me angry in the past

-When others laugh in response to stories I tell about aggravating situations, I don't feel as bothered by them as I once was.

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[2] These items also capture Perspective Taking, Public Coping Humor, After the Event. They were categorized as Affiliative due to the emphasis on the intent to elicit positive social support

Appendix C

THE WATERLOO USES OF HUMOR INVENTORY

We are interested in finding out how people use humor to cope with events in their daily lives. For the purpose of being as clear as possible, we have included items that sound quite similar to each other. However, there are slight differences between them. Please read each item carefully and indicate the extent to which you engage in the following by circling the response to each statement that most appropriately describes your behaviour.

1 = Never (not at all) 2 = Rarely (you do it but very infrequently)

3 = Occasionally (once in a while) 4 = Frequently (quite often)

5 = Always (all of the time)

1. I tell jokes to make others laugh when I feel that a situation is getting too tense

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

2. I try to think of something amusing to distract myself from my own fears or worries

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

3. I tell funny stories about situations that have made me angry in the past

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

4. I laugh privately to myself about my short-comings

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

5. I change my moods at times of crisis by imagining funny things

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

6. I share stories about my more embarrassing moments to make people laugh

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

7. While I am in an irritating or awkward situation, I start thinking about how I would talk about it in a funny way to my friends

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

8. I make fun of my short-comings before anyone else can.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

9. I tell jokes or recount funny things I have seen on TV when I feel uncomfortable during a long silence in a group conversation.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

1 = Never (not at all) 2 = Rarely (ybu do it but very infrequently)

3 = Occasionally (once in a while) 4 = Frequently (quite often)

5 = Always (all of the time)

10. I deal with people who are angry or upset with me by trying to make them laugh

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

11. I feel better when people laugh at stories about my more embarrassing moments.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

12. I privately make fun of people when I feel they are mistreating me.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

13. Immediately after something upsetting has happened to me I tell my friends about it in a humorous way.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

14. I try to find something to laugh at when I feel myself becoming upset

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

15. I privately make fun of people when they bother me.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

16. I laugh to myself about my past mistakes, even though I didn't think they were amusing at the time they happened.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

17. I tell funny stories about things that have happened to me when I'm in an awkward social situation

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

18. I am able to see humor in events that I had once experienced as being quite distressing.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

19. It makes me feel better when I share stories about my past embarrassments.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

1 = Never (not at all) 2 = Rarely (you do it but very infrequently)

3 = Occasionally (once in a while) 4 = Frequently (quite often)

5 = Always (all of the time)

20. I laugh and joke as a way to avoid talking about something that is bothering me.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

21. When someone is angry with me, I don't laugh out loud, but I privately make fun of their behaviour.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

22. I laugh to myself when I think of the embarrassing things I have done in the past.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

23. When someone makes fun of my short-comings, I will reply by poking fun at them.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

24. I use my wit to defend myself when I feel someone is threatening me.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

25. When I make a mistake or do something embarrassing, I laugh first so people will laugh with me and not at me.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

26. I respond to people who are insulting or rude to me by making fun of them in front of others.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

27. When others laugh in response to stories I tell about embarrassing experiences, I realize how silly it was to be upset about them in the first place.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

28. I try to make myself think of funny things when I find that my mind is filled with worrisome thoughts.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

1 = Never (not at all) 2 = Rarely (you do it but very infrequently)

3 = Occasionally (once in a while) 4 = Frequently (quite often)

5 = Always (all of the time)

29. Other people tell me that I make jokes or act silly to avoid dealing with serious matters.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

30. I make fun of the irritating people in my life when I'm with my friends.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

31. I privately make fun of myself when I make mistakes or do something embarrassing.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

32. I try to find something or somebody else to make fun of when I feel I have made a fool of myself.

1	2	3	4	5
Never	Rarely	Occasionally	Frequently	Always

Appendix D

Table 1D: Interpretation of the pattern matrix following principal components exploratory factor analysis with an oblique rotation – 3 factors specified (Females Only)

ITEMS	COMPONENTS		
	1	2	3
Factor 1: Perspective Taking Humor			
6. I share stories about my more embarrassing moments to make people laugh	**0.8**	--	-0.17
19. It makes me feel better when I share stories about my past embarrassments	**0.79**	--	--
11. I feel better when people laugh at stories about my more embarrassing moments.	**0.76**	--	-0.11
22. I laugh to myself when I think of the embarrassing things I have done in the past.	**0.71**	--	--
18. I am able to see humor in events that I had once experienced as being quite distressing	**0.68**	-0.14	--
16. I laugh to myself about my past mistakes, even though I didn't think they were amusing at the time they happened	**0.65**	--	--
27. When others laugh in response to stories I tell about embarrassing experiences, I realize how silly it was to be upset about them n the first place.	**0.65**	--	--
3. I tell funny stories about situations that have made me angry in the past	**0.57**	--	0.12
17. I tell funny stories about things that have happened to me when I'm in an awkward social situation	**0.53**	0.12	0.16
31. I privately make fun of myself when I make mistakes or do something embarrassing.	0.48	0.13	0.2
Factor 2: Aggressive Humor			
15. I privately make fun of people when they bother me	--	**0.83**	-0.13
12. I privately make fun of people when I feel they are mistreating me	--	**0.81**	-0.16
30. I make fun of the irritating people in my life when I'm with my friends	--	**0.78**	-0.14
26. I respond to people who are insulting or rude to me by making fun of them in front of others	--	**0.76**	--
21. When someone is angry with me, I don't laugh out loud, but I privately make fun of their behaviour	--	**0.71**	0.14
32. I try to find something or somebody else to make fun of when I feel I have made a fool of myself.	-0.21	**0.7**	0.15
23. When someone makes fun of my short-comings, I will reply by poking fun at them.	--	**0.62**	--

Factor 3: Avoidant Humor			
14. I try to find something to laugh at when I feel myself becoming upset	--	-0.14	**0.82**
28. I try to make myself think of funny things when I find that my mind is filled with worrisome thoughts	--	-0.11	**0.81**
5. I change my moods at times of crisis by imagining funny things	--	-0.13	**0.81**
2. I try to think of something amusing to distract myself from my own fears or worries	--	--	**0.71**
10. I deal with people who are angry or upset with me by trying to make them laugh	--	0.11	**0.42**
1. I tell jokes to make others laugh when I feel that a situation is getting too tense	0.25	--	0.3

Table 2D: Interpretation of the pattern matrix following principal components exploratory factor analysis with an oblique rotation – 3 factors specified (Males Only)

ITEMS	COMPONENTS		
	1	2	3
Factor 1: Perspective Taking Humor			
11. I feel better when people laugh at stories about my more embarrassing moments.	**0.74**	0.15	0.2
16. I laugh to myself about my past mistakes, even though I didn't think they were amusing at the time they happened.	**0.73**	-0.11	--
22. I laugh to myself when I think of the embarrassing things I have done in the past.	**0.73**	--	--
19. It makes me feel better when I share stories about my past embarrassments	**0.71**	--	--
6. I share stories about my more embarrassing moments to make people laugh	**0.66**	0.12	--
18. I am able to see humor in events that I had once experienced as being quite distressing.	**0.62**	-0.1	-0.1
31. I privately make fun of myself when I make mistakes or do something embarrassing.	**0.49**	--	-0.21
27. When others laugh in response to stories I tell about embarrassing experiences, I realize how silly it was to be upset about them in the first place.	**0.49**	--	-0.21
3. I tell funny stories about situations that have made me angry in the past	**0.46**	0.2	-0.13

Factor 2: Aggressive Humor			
12. I privately make fun of people when I feel they are mistreating me	--	**0.82**	0.14
15. I privately make fun of people when they bother me	--	**0.79**	--
30. I make fun of the irritating people in my life when I'm with my friends	--	**0.76**	0.11
26. I respond to people who are insulting or rude to me by making fun of them in front of others.	-0.19	**0.69**	-0.18
23. When someone makes fun of my short-comings, I will reply by poking fun at them.	0.13	**0.63**	--
32. I try to find something or somebody else to make fun of when I feel I have made a fool of myself	-0.16	**0.59**	-0.18
21. When someone is angry with me, I don't laugh out loud, but I privately make fun of their behaviour	--	**0.56**	--
Factor 3: Avoidant Humor			
5. I change my moods at times of crisis by imagining funny things	--	--	**-0.82**
28. I try to make myself think of funny things when I find that my mind is filled with Worrisome thoughts.	--	--	**-0.82**
2. I try to think of something amusing to distract myself from my own fears or worries	--	--	**-0.74**
14. I try to find something to laugh at when I feel myself becoming upset	0.13	--	**-0.73**
1. I tell jokes to make others laugh when I feel that a situation is getting too tense	0.19	0.21	-0.48
10. I deal with people who are angry or upset with me by trying to make them laugh	0.25	0.13	-0.47

Appendix E

THE COPING HUMOR SCALE

Please indicate the extent to which you agree or disagree with each statement by circling the appropriate number.

1. I often lose my sense of humor when I'm having problems.

1	2	3	4
strongly disagree	**mildly disagree**	**mildly agree**	**strongly agree**

2. I have often found that my problems have been greatly reduced when I tried to find something funny in them.

1	2	3	4
strongly disagree	**mildly disagree**	**mildly agree**	**strongly agree**

3. I usually look for something comical to say when I am in tense situations.

1	2	3	4
strongly disagree	**mildly disagree**	**mildly agree**	**strongly agree**

4. I must admit my life would be easier if I had more of a sense of humor.

1	2	3	4
strongly disagree	**mildly disagree**	**mildly agree**	**strongly agree**

5. I have often felt that if I am in a situation where I have to either cry or laugh, it's better to laugh.

1	2	3	4
strongly disagree	**mildly disagree**	**mildly agree**	**strongly agree**

6. I can usually find something to laugh and joke about even in trying situations.

1	2	3	4
strongly disagree	**mildly disagree**	**mildly agree**	**strongly agree**

7. It has been my experience that humor is often a very effective way of coping with problems.

1	2	3	4
strongly disagree	**mildly disagree**	**mildly agree**	**strongly agree**

SITUATIONAL HUMOR RESPONSE QUESTIONNAIRE

Humor and laughter mean different things to different people. Each of us have our own conceptions of what kinds of situations are funny, our own notions of the appropriateness of humor in various situations, and our own sense of the importance of humor in our lives.

In this questionnaire you will find descriptions of a number of situations in which you may have found yourself from time to time. nor each question, please take a moment to recall a time when you were actually in such a situation. If you cannot remember such an experience, try to imagine yourself in such a situation, filling in the details in ways that reflect your own experience. Then circle the appropriate letter (a, b, c, d, or e) which corresponds to the phrase that best describes the way you have responded or would respond in such a situation.

1. If you were shopping by yourself in a distant city and you unexpectedly saw an acquaintance from school (or work), how have you responded or how would you respond?
   a) I would probably not have bothered to speak to the person.
   b) I would have talked with the person but wouldn't have shown much humor.
   c) I would have found something to smile about in talking with him/her.
   d) I would have found something to laugh about with the person.
   e) I would have laughed heartily with the person.

2. If you were awakened from a deep sleep in the middle of the night by the ringing of the telephone, and it was an old friend who was just passing through town and had decided to call and say hello....
   a) I wouldn't have been particularly amused.
   b) I would have felt somewhat amused but would not have laughed.
   c) I would have been able to laugh at something funny my friend said.
   d) I would have been able to laugh and say something funny to my friend.
   e) I would have laughed heartily with my friend.

3. You had accidentally hurt yourself and had to spend a few days in bed. During that time in bed, how would you have responded?
   a) I would not have found anything particularly amusing.
   b) I would have smiled occasionally.
   c) I would have smiled a lot and laughed from time to time.
   d) I would have found quite a lot to laugh about.
   e) I would have laughed heartily much of the time.

NOTE: Remember to try to recall times when you actually have been in these situations. If you cannot remember such experiences, try to imagine yourself in the situation.

4. When you have been engaged in some lengthy physical activity (e.g., swimming, hiking, skiing), and you and your friends found yourselves to be completely exhausted...

a) I wouldn't have found it particularly amusing.
b) I would have been amused, but wouldn't have shown it outwardly.
c) I would have smiled.
d) I would have laughed.
e) I would have laughed heartily.

5. If you arrived at a party and found that someone else was wearing a piece of clothing identical to yours...

a) I wouldn't have found it particularly amusing.
c) I would have been amused, but wouldn't have shown it outwardly.
c) I would have smiled.
d) I would have laughed.
d) I would have laughed heartily

6. If a friend gave you a puzzle to solve and you found, much to your friend's surprise, that you were able to solve it very quickly,

a) I wouldn't have found it particularly amusing.
b) I would have been amused, but wouldn't have shown it outwardly.
c) I would have smiled.
d) I would have laughed.
e) I would have laughed heartily.

7. On days when you've had absolutely no responsibilities or engagements, and you've decided to do something you really enjoy with some friends, to what extent would you have responded with humor during the day?

a) The activity we were engaged in would not have involved much smiling or laughter.
b) I would have been smiling from time to time, but wouldn't have had much occasion to laugh aloud.
c) I would have smiled frequently and laughed from time to time.
d) I would have laughed aloud quite frequently.
e) I would have laughed heartily much of the time.

NOTE: Remember to try to recall times when you actually have been in these situations. If you cannot remember such experiences, try to imagine yourself in the situation.

8. You were traveling in a car in the winter and suddenly the car spun around on an ice patch and came to rest facing the wrong way on the opposite side of the highway. You were relieved to find that no one was hurt and no damage had been done to the car...

a) I wouldn't have found it particularly amusing.
b) I would have been amused, but wouldn't have shown it outwardly.
c) I would have smiled.
d) I would have laughed.
e) I would have laughed heartily.

9. If you were watching a movie or TV program with some friends and you found one scene particularly funny, but no one else appeared to find it humorous, how would you have reacted most commonly?

a) I would have concluded that I must have misunderstood something or that it wasn't really funny.
b) I would have "smiled to myself", but wouldn't have shown my amusement outwardly.
c) I would have smiled visibly.
d) I would have laughed aloud.
e) I would have laughed heartily.

10. If you were having a romantic evening alone with someone you really liked (girlfriend, boyfriend, spouse, etc.)...

a) I probably would have tended to be quite serious in my conversation.
b) I'd have smiled occasionally, but probably wouldn't have laughed aloud much.
b) I'd have smiled frequently and laughed aloud from time to time.
d) I'd have laughed aloud quite frequently.
e) I'd have laughed heartily much of the time.

11. If you got an unexpectedly low mark on an exam and later that evening you were telling a friend about it....

a) I would not have been amused.
c) I would have been amused, but wouldn't have shown it outwardly.
c) I would have been able to smile.
d) I would have been able to laugh.
e) I would have laughed heartily.

NOTE: Remember to try to recall times when you actually have been in these situations. If you cannot remember such experiences, try to imagine yourself in the situation.

12. You thought you recognized a friend in a crowded room. You attracted the person's attention and hurried over to him/her, but when you got there you discovered you had made a mistake and the person was a total stranger...

a) I wouldn't have found it particularly amusing.
b) I would have been amused, but wouldn't have shown it outwardly.
c) I would have smiled.
d) I would have laughed.
e) I would have laughed heartily.

13. If you were eating in a restaurant with some friends and the waiter accidentally spilled a drink on you...

a) I wouldn't have found it particularly amusing.
b) I would have been amused, but wouldn't have shown it outwardly.
c) I would have smiled.
d) I would have laughed.
e) I would have laughed heartily

14. If you were crossing a street at a crosswalk and an impatient car driver, who had had to stop for you, honked the horn...

a) I would not have been amused.
b) I would have been amused, but wouldn't have shown it outwardly.
c) I would have smiled.
d) I would have laughed
e) I would have laughed heartily

15. If there had been a computer error and you had spent all morning standing in line-ups at various offices trying to get the problem sorted out...

a) I wouldn't have found it particularly amusing.
b) I would have been able to experience some amusement, but wouldn't have shown it.
c) I would have smiled a lot.
d) I would have laughed a lot.
e) I would have laughed heartily.

NOTE: Remember to try to recall times when you actually have been in these situations. If you cannot remember such experiences, try to imagine yourself in the situation.

16. If the teacher announced that s/he would hand back the exams in order of grade, beginning with the highest mark in the class, and your name was one of the first to be called...

a) I wouldn't have found it particularly amusing.
c) I would have been amused, but wouldn't have shown it outwardly.
c) I would have smiled.
d) I would have laughed.
e) I would have laughed heartily.

17. In the past, if your girlfriend (or boyfriend) decided to break up with you because s/he had found someone else, and a few days later you were telling a good friend about it....

a) wouldn't have found any humor in the situation.
b) I would have been able to experience some amusement, but wouldn't have shown it.
c) I would have been able to smile.
d) I would have been able to laugh.
e) I would have laughed quite a lot.

18. If you were eating in a re
staurant with some friends and the waiter accidentally spilled some soup on one of your friends...

a) I would not have been particularly amused.
b) I would have been amused, but wouldn't have shown it.
c) I would have smiled.
d) I would have laughed
e) I would have laughed heartily.

19. In choosing your friends, how desirable do you feel it is for them to be easily amused and able to laugh in a wide variety of situations?

a) the most important characteristic I look for in a friend.
b) very desirable, but not the most important characteristic.
c) quite desirable.
d) neither desirable nor undesirable.
e) not very desirable.

20. How would you rate yourself in terms of your likelihood of being amused and of laughing in a wide variety of situations?

a) my most outstanding characteristic
b) above average
c) about average
d) less than average
e) very little.

21. How much do you vary from one situation to another in the extent to which you laugh or otherwise respond with humor? (i.e., how much does it depend on who you are with, where you are, how you feel, etc.?)

a) not at all
b) not very much
c) to some extent
d) quite a lot
e) very much so

Sample Items from the NEO-Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992).

Neuroticism

1. I am not a worrier
2. I often feel inferior to others.
3. When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.

Extraversion

1. I like to have a lot of people around me.
2. I laugh easily.
3. I really enjoy talking to people.

Openness to Experience

1. I am intrigued by the patterns I find in art and nature.
2. I often enjoy playing with theories or abstract ideas
3. I have little interest in speculating on the nature of the universe or the human condition

Agreeableness

1. I try to be courteous to everyone I meet.
2. I would rather cooperate with others than compete with them.
3. I tend to be cynical and skeptical of others' intentions.

Conscientiousness

1. I keep my belongings clean and neat
2. I try to perform all the tasks assigned to me conscientiously
3. I have a clear set of goals and work toward them in an orderly fashion.

COPE (Carver, Scheier, & Weintraub, 1989) subscales and sample items

Active Coping

1. I concentrate my efforts on doing something about it.
2. I take direct action to get around the problem.

Planning

1. I make a plan of action.
2. I think about how I might best handle the problem.

Suppression of Competing Activities

1. I focus on dealing with this problem, and if necessary let other things slide a little.
2. I try hard to prevent other things from interfering with my efforts at dealing with this.

Restraint Coping

1. I make sure not to make matters worse by acting too soon.
2. I hold off doing anything about it until the situation permits.

Seeking social support for instrumental reasons (Instrumental Social Support)

1. I talk to someone who could do something concrete about the problem.
2. I ask people who have similar experiences what they did.

Seeking social support for emotional reasons (Emotional Social Support)

1. I try to get emotional support from friends and relatives.
2. I talk to someone about how I feel.

Positive Reinterpretation & Growth

1. I look for something good in what is happening.
2. I try to see it in a different light, to make it seem more positive.

Acceptance

1. I accept that this has happened and that it can't be changed.
2. I get used to the idea that it happened.

Turning to Religion

1. I seek God's help.
2. I put my trust in God.

Focus on & Venting of Emotions

1. I get upset and let my emotions out.
2. I let my feelings out.

Denial

1. I refuse to believe that it has happened.
2. I say to myself "this isn't real".

Behavioural Disengagement

1. I give up the attempt to get what I want.
2. I reduce the amount of effort I'm putting into solving the problem.

Mental Disengagement

1. I go to the movies or watch TV, to think about it less.
2. I daydream about things other than this.

Alcohol-Drug Disengagement

1. I use alcohol or drugs to make myself feel better.
2. I try to lose myself for a while by drinking alcohol or taking drugs.

Humor

1. I make jokes about it.
2. I laugh about the situation.

BIDR-IM

Using the scale below as a guide, write a number beside each statement to indicate how much you agree with it.

1	2	3	4	5	6	7
NOT TRUE			**SOMEWHAT TRUE**			**VERY TRUE**

___ 1. I sometimes tell lies if I have to.

___ 2. I never cover up my mistakes.

___ 3. There have been occasions when I have taken advantage of someone.

___ 4. I never swear.

___ 5. I sometimes try to get even rather than forgive and forget.

___ 6. I always obey laws, even if I'm unlikely to get caught.

___ 7. I have said something bad about a friend behind his or her back.

___ 8. When I hear people talking privately, I avoid listening.

___ 9. I have received too much change from a salesperson without telling him or her.

___ 10. I always declare everything at customs.

___ 11. When I was young I sometimes stole things.

___ 12. I have never dropped litter on the street.

___ 13. I sometimes drive faster than the speed limit.

___ 14. I never read sexy books or magazines.

___ 15. I have done things that I don't tell other people about.

___ 16. I never take things that don't belong to me.

___ 17. I have taken sick-leave from work or school even though I wasn't really sick.

___ 18. I have never damaged a library book or store merchandise without reporting it.

___ 19. I have some pretty awful habits.

___ 20. I don't gossip about other people's business.

Appendix F

Items from the Cheerfulness Scale of the STCI-T<60> (Ruch, Kohler, & van Thriel, 1996)

2 My way of life can be described as positive and carefree. .....

4 I am a cheerful person. .....

9 I can be made to laugh easily. .....

14 I can easily unwind and enjoy the moment. .....

16 Everyday life often gives me the occasion to laugh. .....

19 I have a "sunny" nature. .....

22 I often smile. .....

25 Laughing has a contagious effect on me. .....

26 I often find that the small things in everyday life are really funny and amusing.

30 I like to laugh and do it often. .....

32 I am a merry person. .....

35 Many adversities of everyday life actually do have a positive side. .....

38 I feel completely contented being with cheerful people. .....

41 The good mood of others has a contagious effect on me. .....

44 I often find the slight mishaps of everyday life amusing, even if they happen to me. .....

46 I am often in a good mood, even without a specific reason. .....

50 I am often in a joyous mood. .....

53 Experience has shown me that the proverb "Laughter is the best medicine" is really true. .....

57 I like to kid around with others. .....

59 It is easy for me to spread good cheer. .....

PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate number on the sheet below. Indicate to what extent you feel each emotion **right now**.

1 slightly **2** a little **3** moderately **4** quite a bit **5** extremely

_____ interested	_____ irritable
_____ distressed	_____ alert
_____ excited	_____ ashamed
_____ upset	_____ inspired
_____ strong	_____ nervous
_____ guilty	_____ determined
_____ scared	_____ attentive
_____ hostile	_____ jittery
_____ enthusiastic	_____ active
_____ proud	_____ afraid

TRANSCRIPT OF MALE DEMONSTRATION VIDEO

(Starring Laurent Lappiere)

Experimenter: "I'd like to thank you for volunteering to demonstrate these tasks today"
Participant: "Sure"
Experimenter: "As I told you before, the tasks you will be doing today are designed to measure a wide range of cognitive abilities."

STROOP TEST

Experimenter: "The first task I am going to ask you to do is designed to assess your reading speed and accuracy."
Participant: "OK"
Experimenter: "You'll be shown a card of words like this. And what I would like you to do is to read all of the words on this card out loud, in order, as fast as you can."
Participant: [*looks serious; studies the card as rest of instructions are given]*
Experimenter: "Begin at the top right corner and proceed across each row towards the end. You will have 30 seconds in which to read as many of the words as you can out loud. Most people can do most of the card. Any questions?"
Participant: "Uh...No"
Experimenter: " Ready?"
Participant: "Ya"
Experimenter: Go!
Participant: [*reads words seriously*]

Experimenter: "Now, I would like you to do the same thing again, only this time the words.., as you can see the words are written in different colours."
Participant: *[studies card seriously as listens to instructions]*
Experimenter: "As with the other card, I would like you to read all of the words on the card, out loud in order as fast as you can. You will be given 30 seconds in which to read all of the words. Most people can read all of them in that time..."
Participant: [raises eyebrows, looks surprised]
Experimenter: "...and typically make only 1 or 2 errors"
Participant: [slight chuckle]
Experimenter: "Any questions?"
Participant: "No, no. Let's go, let's go"
Experimenter: "Ready?"
Participant: "Ya"
Experimenter: " Go."
Participant: [reads words in monotone voice, shakes head occasionally to own rhythm as he reads,]

Experimenter: "This time instead of reading the words I want you to tell me the

colours in which these words are written. Do not read the words, just tell me the colour of each one."

Participant: "OK." *[studies card seriously as listens to instructions]*

Experimenter: "Work as quickly as you can. Most people take about 45 seconds and make no more than 5 errors."

Participant: "OK"

Experimenter: " When I say 'Go', start with the first word and go across to the end.

Participant: "Top right?"

Experimenter: " No, top left. Any questions?"

Participant: "No"

Experimenter: " O.K. Ready?"

Participant: "Ya"

Experimenter: Go.

Participant: [row 1, after 5th word: laugh; as attempts 1st colour , row 2: "Uh...(laugh); after last item row 2, looks directly at camera with mouth open as if in shock/ mock panic; as attempts 1st colour, row 3 "Uh.."; after 2nd colour, row 3: laugh (for approx 3 or 4 secs)] (time: 27 secs)

MENTAL ARITHMETIC

Experimenter: "This next task is designed to assess your math skills."

Participant: [looks directly at camera-in a disparaging fashion, as if to say "How stupid."]

Experimenter: "What I would like *you* to do is to count backwards by 13 from 7783. "

Participant: *[Smile]*

Experimenter: " I want you to count backwards as fast as you can, telling me as many correct numbers in the *series* as possible. Most people can name off at least 10 numbers in the series correctly."

Participant: "In how long?"

Experimenter: "Well, you'll have 30 seconds."

Participant: "OK, OK."

Experimenter: "Any questions?"

Participant: "No (smile)"

Experimenter: "O.K. Just to remind you, your task is to count backwards by 13 from 7000, 700 and.."

Participant: [along with experimenter] ".. and 83."

Experimenter: "Ready?"

Participant: "Ya"

Experimenter: "Go."

Participant: "7 thousand, 7 hundred and eighty three, 7 thousand, 7 hundred and ..70; 7000 700 and..uh..(laugh) 57 (smile); 7000, 700 and uh....44 ; 7000, 700, and uh..31 Oh God! (opens eyes wide) (laugh)"

REMOTE ASSOCIATES TEST

Experimenter: "This last task is designed to assess creativity, or in other words, your ability to play with abstract concepts. I am going to tell you 3 words and what I would like you to do is to tell me a fourth word which is related to all 3. For example, what word do you think is related to: Cookies, Sixteen, and Heart "

Participant: [smiles; repeats words quietly to himself as he looks up, thinking]..."Sweet!"

Experimenter: "That's right. The answer in this case is "Sweet". Cookies are sweet, sweet is part of the phrase "sweet sixteen" and part of the word "sweetheart"

Participant: [smiles, raises eyebrows up and down like Groucho Marx; looks pleased with himself]

Experimenter: "Here is another example: Poke, Go, Molasses"

Participant: [pauses for a few seconds thinking seriously, looking down at the table] (quickly:)" Oh my god, who thinks these things up?! (laughs) uh...(thinking) (repeats words under his breath) Uh.... Sticky?...Uh.....Slow. "(smiles)

Experimenter: "That's right. "Slow poke", "Go slow", "slow as molasses". As you can see, the fourth word may be related to the other 3 words for various reasons. Try these next 2: Surprise, Line, Birthday"

Participant: "Party! Party, ya. (dances for a few seconds in chair)"

Experimenter: "Let's try 1 more. Base, Snow, Dance"

Participant: "[opens eyes wide in an exaggerated fashion] No idea!"

Experimenter: "The answer is ball"

Participant: "OK, OK"

Experimenter: "baseball, snowball, and dance is a kind of ball"

Participant: "Alright" [taps desk]

Experimenter: "In the next few minutes, I am going to read you some more groups of words and your task is to come up with the fourth word that is related to all 3."

Participant: "OK"

Experimenter: "You will have 3 minutes in which to complete as many of the 15 items as possible. Most people are able to answer..."

Participant: [yawn]

Experimenter:"...at least 10 of them."

Participant: [Sarcastically]: " Right. OK"

Experimenter: "If you can't think of the answer to one group of words, say "Pass" and we'll go onto the next one. " *Participant*: "You're going to hear a lot of "Pass". (as looks directly at experimenter, smiling for a few seconds. Continues to smile during next sentence of instructions).

Experimenter: "If there is time left, I'll come back to it and ask you again. Here's the first one..."

DOUBLE ENTENDRE WORD ASSOCIATION TASK

Subject #: _____ Date: _____

Stimulus	Response	Time	Stimulus	Response	Time
1. Foot			21. Sugar		
2. Face			22. Nuts		
3. Plant			23. Cross		
4. Voice			24. Make		
5. Earth			25. Carpet		
6. Miss			26. Crack		
7. Door			27. Lamp		
8. Alone			28. Screw		
9. Good			29. Paper		
10. Ride			30. Prick		
11. Light			31. Measure		
12. Work			32. Blow		
13. Rubber			33. Garden		
14. Health			34. Cock		
15. Ocean			35. Stove		
16. Bust			36. Mount		
17. Fire			37. City		
18. Watch			38. Hump		
19. Snatch			39. Water		
20. Drink			40. Piece		

Appendix G

Experimental Consent Form

Investigators: Stacy Thomas, Clinical Psychology Ph.D. Candidate
Dr. Herbert Lefcourt, Professor, Department of Psychology

Supervisor: Dr. Herbert Lefcourt, Professor, Department of Psychology

This project has been reviewed and has received ethics approval through the Office of Human Research & Animal Care at the University of Waterloo. However, if you have any concerns resulting from your participation in this study, please contact this Office at 885-1211, x6005.

I, the undersigned, understand that this research is investigating the effect of mood on the ability to perform a variety of cognitive tasks. I further understand that the procedure involves completing some questionnaires, watching a videotape demonstrating the cognitive tasks, doing the tasks, and then talking about my experience doing the tasks after I have completed them.

I understand that for the purposes of ensuring the accuracy of the data collected, my responses will be video- or audio-recorded. I also understand that both my anonymity and the confidentiality of the data I provide for this study will be protected, that I may withdraw from the study at any time, and finally, I understand that only authorized investigators will have access to my responses. I also understand that all of my data will be kept in a locked research area, that the only identification on this material will be a code known only to the experimenter, and that the video and audio-tapes will be erased after all of the necessary data has been coded.

Finally, I understand that completion of this study will take approximately one hour of my time and that I will receive experimental credit for my participation.

Name (please print): _____

Student Number: _____

Signature: _____

Date: __ _____

Oral Debriefing

1) Participants will first be probed to determine whether they had any suspicions about the study. The following questions will be asked:

"Now that you're finished, I'd like to talk with you about how you felt the experiment went..

1. It would be helpful if you would share any thoughts about how the procedures struck you?
2. Was there any aspect of the study that you found odd, confusing or disturbing?
3. Do you think there's more to this study than what I have told you today?
4. Do you have any thoughts about what else may be involved in this study? "

2) The following oral feedback will then be given:

"It is now time that I explain the whole study to you so that you understand something important. Even though you were told that this study is about the influence of mood on the ability to perform different cognitive tasks, we are actually not interested in how you performed on any of the cognitive tests we asked you to do. In fact, I didn't even record how you scored on any of these tasks. Instead of being interested in how you scored compared to other people, we are interested in seeing how you reacted to the stress of having to do these difficult tasks. These tests were chosen not because we are interested in any ability they may measure, but because they are thought to cause most people to feel anxious and stressed, especially when they are administered in the way they were administered to you today. All of the cognitive tasks we asked you to do are very difficult for most people. In addition, asking you to give verbal responses, to do the tasks as quickly as possible, timing your performance, and giving you feedback about what you did wrong on some tasks makes them even more diff cult. The information that we gave you in the video about how most people perform on the

tasks was therefore false. There are very few people who could perform that well on these tasks.

Do you have any questions or concerns about what I've told you so far?

As I said before, the reason why we tried to give you the impression that these tasks are doable by most people and then tried to make them very difficult so that most people could not do well on them, was to increase the likelihood that you would feel stressed and that we would see people's natural responses to this kind of situation.

I guess you are wondering why we would purposely want to stress people out? Well, we are interested in seeing how people differ in the way they deal with this kind of stress. Research suggests that the amount of stress people feel in a particular situation can vary depending on the way they cope with it. We wanted to see how people cope with the stressfulness of these tasks and if the different ways in which people cope has an effect on mood. If we told you the whole truth about the tests, that they are very difficult and that most people don't do very well on them, chances are you would not have tried very hard and would therefore not have felt much stress while doing them.

In addition to observing how people react during a stressful experiences we are also interested in investigating whether the way people talk about their experiences can influence the impact of the stressor. More specifically, we are interested in seeing if different types of humor differ in their effectiveness in being able to reverse the impact of the stress experienced as a result of doing the task. This is why we asked you to talk about your experience doing the tasks in a funny way after completing them. Your conversation on the telephone was audio-recorded so that we can later code the type of humor you used when relating this experience to your imagined friend.

If you were fooled by this study, you should not feel that it is through any fault of your own. When we designed this study, we worked hard to make up a convincing story that you would believe, and we find that most people believe it. The reason for the deception was to create a "real life" situation for you, and I hope the fact that I deceived you about the real purpose of the study does not bother you now.

Can you explain your understanding of why we had to use deception?

Here is a sheet that explains everything I have just told you, plus a few more details. If you have any questions now, or in the future, please do

not hesitate to come and see me. You can leave a message for me with the psychology department secretaries and I will return your call.

(Pause to give the participant time to read the feedback form)

Do you have any other questions about the study?

Now that you know about the experiment, I just want to make sure that you are still willing to let us use your data fro research. If so, could you please sign this form indicating your consent to use your data. Thank you.

One last thing. It is really important that participants who come into this experiment are completely naive, that is, do not know anything about the deception involved. For this reason, it is important that you do not tell anyone who might be a potential participant in this study. If you do, their data will be misleading and unusable. If people do ask about the experiment, just tell them the cover story I told you, that it was a study of the way mood effects the way people perform on a number of cognitive tasks. The most important thing is that they do not know that the tasks are actually very hard to do and that we are really interested in investigating peoples' reactions to the stress of doing them.

It is also really important that you do not tell potential participants that we asked you to try to talk about this experience in a humorous way. As you read on the feedback form, the way in which people use humor to cope with this experience may have different effects on their mood. If people know that we are going to ask them to do this, then they may prepare something in advance, and we have reason to believe that telling a rehearsed story likely has a different impact on mood than a story that one makes up more or less on the spot. Therefore, data from people who know about this aspect of the study may be misleading and unusable. So again, if people ask you about the study, just tell them that we are interested in seeing the impact of mood on the ability to do a number of cognitive tasks.

Well, we are finished. Thank you for your participation."

Post-debriefing Consent Form

Project Title: Evaluation of the effectiveness of using humor to cope both during and after a potentially stressful experience

Investigators: Stacy Thomas, Clinical Psychology Ph.D., Candidate
Professor Herb Lefcourt, Ph.D.

During the debriefing session, I learned that it was necessary for the researchers to use a mild deception in this study. I understand that this mild deception ras necessary because having information about the actual purpose of the study might have influenced the ways in which I responded to the tasks. Thus, to ensure that this did not happen, either some details about the purpose of the study initially were not provided or were provided in a manner that slightly misrepresented the real purpose of the study.

However, I have now received a complete verbal and written explanation as to the actual purpose of the study and have had an opportunity to ask any questions about the study that I had, and I have received acceptable answers to my questions.

I understand that my performance on the cognitive tasks was video-taped and that the pretend phone conversation was audio-taped. I have been asked to give permission for the researchers to use this data, as well as the data obtained from the questionnaires I completed, in their study, now that I know the full intent and purpose of the study, and agree to this request. My signature below indicates this agreement. I understand, however, that I may withdraw this consent at any time by notifying Stacy Thomas or Dr. Lefcourt (888-4567, x 2549) of this decision. I also understand that I may contact the Office of Human research at 888-4567 x6005 if I have any concerns or comments about my involvement in the study.

Participant's Name: _____

Participant's Signature: _____

Date: _____

Witness's Signature: _____

Date: _____

FEEDBACK TO PARTICIPANTS

People often say that their sense of humor helped them get through a difficult situation. We have been trying to investigate how people use humor, when they use humor, and what kind of humor they use to deal with various kinds of stressful situations in their lives.

The study you just completed was designed to investigate the way people use humor to cope with the stress of completing a number of cognitive tasks under time-pressure. We are interested in seeing whether or not people would use humor to cope with this situation, and if so, if using humor is an effective way to minimize the stress people likely feel during and after completing these tasks. We are also interested in investigating whether different ways of using humor vary in their ability to reverse unpleasant or negative feelings. For instance, is laughing at or making fun of your mistakes as effective in improving one's mood as laughing at or making jokes about the tasks? In addition, does the type of humor people use to cope depend on their sex? For instance, are males more likely than females to make jokes about the tasks and are females more likely than males to laugh when they make mistakes?

Another purpose of the study is to see if using humor and the type of humor people use to cope in this situation can be predicted from responses to two questionnaires you completed as part of the Mass Testing process. One of the questionnaires you completed was the Coping Humor Scale which assesses how likely individuals are to use humor to cope with events in their lives. It is expected that people who obtained high scores on this scale, indicating that they tend to use humor to cope a lot, will be more likely to use humor while completing the cognitive tasks than those who obtained low scores on this scale. The other questionnaire is the Uses of Humor Inventory. This questionnaire, which we developed, asks people to rate the extent to which they use different kinds of humor behaviours (such as laughing or joking) to deal with a variety of potentially stressful situations. We hope to find that the way people describe the way they typically use humor to cope on this questionnaire is related to the way they behave in the lab. If we see that people who say they tend to make fun of themselves on the questionnaire actually do this in the lab, then it will show that this questionnaire is a valid tool for predicting peoples' behaviour in real life.

We want to thank you for your participation in this study. You have provided us with much valuable information about how people use humor to cope with stress. We hope that with your participation we will gain a deeper understanding of how people can use humor most effectively to cope with life events. If you have any further questions, feel free to contact me, Stacy Thomas at 885-1211 ext. 3842

(se2thoma@watarts). You may also contact Dr. Susan Sykes at the Office of Human research (888-4567 x6005) if you have any questions or concerns about your involvement in this study.

One final point. We ask that you not tell others about the details of this study. The reason for this is that if potential participants know what the study is about, this information will influence their responses, and we would obtain misleading information from them. Therefore, it is important that you do not talk about this study to your friends or to other people who may be in the study in the future, or allow them to read this feedback sheet. Also, please do not tell others who may have contact with potential participants.

Thank you again for your participation and for not telling others about the details of this study.

Appendix H

Coding Manual for Humorous Narratives

General Overview:

The following coding manual was used to quantify qualitative aspects of participants' stories about a potentially stressful situation they experienced in the lab. The specific qualities of interest are the type of humor communicated and the humorousness of participants' accounts.

Participants were instructed to talk about the situation they had experienced in the lab in a humorous way, like they would to a friend. Participants approached this task in two general ways: some focused on sharing their experience by talking about the aspects of the situation that they found amusing; others focused more on being humorous, on telling a story that would be entertaining and humorous to others. This coding scheme recognizes both approaches. Unlike humorous attributions, statements intended to make the listener laugh involve some form of 'joke work', which can include all or any of the following:

-the use of exaggeration,
-a pun or play on words,
-irony,
-sarcasm,
-a silly voice,
-an increase in voice pitch or tempo,
-any form of dramatic expression.

Humorous attributions and instances of entertaining humor are categorized as reflecting perspective-taking humor, aggressive humor, or avoidant humor. Perspective-taking humor is defined as humor that demonstrates the speaker's ability to see him/herself and/or the potentially stressful situation as humorous or absurd. Aggressive humor

is defined as humor that focuses on others' short-comings or 'puts down' others or the situation. Instances of avoidant humor were expected to be very rare. Avoidant Humor is defined as humorous comments that are tangentially related or completely unrelated to the situation participants were asked to talk about, or the description of humorous events that are clearly the product of fantasy. Finally, sums reflecting the total amount of each kind of humor communicated in participants accounts are calculated [e.g., Total Perspective-Taking Humor = (the number of Perspective-Taking Humorous Attributions) + (the number of instances of Entertaining Perspective-Taking Humor)].

Scoring Criteria

Coding Perspective-Taking Humor :

This category is meant to capture the extent to which participants shared with the listener, their view of themselves and/or the lab situation as humorous. Evidence for adoption of a humorous perspective of the self and/or the situation is defined as a description of the subject's character, performance or of the tasks that is accompanied by laughter and/or explicit statements about the humorousness of these aspects of the situation.

In addition:

a) the tone of explicit statements regarding the humorousness of the speaker's own performance in the lab or of the laboratory tasks should be consistent with their content (i.e., sound genuine). Descriptions that are consistent with the content of this category but which are delivered with a depressive tone of voice are not included.

b) descriptions of the person in the demonstration video as humorous are also not included

Examples:

e.g. "And ah (laugh) after blow I just started laughing because it just like sounded so funny. (laugh)"

"I had to do math backwards(?). It wouldn't work (laugh) very well for me"

"..but then the funnier part came when you had to associate words with a certain thought."

"But then when I had to say the colours of the words I was screwing up and it was making me laugh and stuff"

"..it is sort of funny in the sense that I'm doing it and I can't really explain what I'm doing"

Instances of entertaining humor reflecting Perspective-Taking share the same focus as described above, only these statements attempt to make the listener laugh as indicated by the presence of some form of joke work.

Examples:

"She she (faster:) wanted me to count backwards by thirteen from like 7,700 and something"

"I'm there, she starts.. giving me this (faster:) sheet of paper, I gotta read... I've gotta read these words off a sheet of paper. (faster:) Oh my god. She must of thought I was il-illiterate!

I was making up new colors I hadn't even heard of!"

"I was really slow and I had to do all this math stuff, and I felt like I was about 3 years old!"

Coding Aggressive Humor

This category is meant to capture the extent to which participants laugh at others, that is, find humor at another's expense or in another's misfortune. This category also includes derogating statements about the study that are accompanied by laughter, and sarcastic remarks. The person in the demonstration video will likely be the focus of attributions that indicate aggressive humor. The only statements involving the person in the demonstration video that should be coded here are those that describe finding humor in perceived upset demonstrated by the person in the video, in the difficulty the person in the video had with the tasks, or humorous statements that derogate the person in the video.

This category does not include:

a) Statements that describe the person in the demonstration video as being humorous (e.g., as having a humorous personality, of perceiving their jokes or silly behaviour as humorous)

Examples:

"...she would say stupid stuff and it was like, I don't know, it was just bad (laugh)"

" (laughing:) it was funny 'cause she was just very upset, it looked like, with all that was going on (laugh). It was hilarious."

"...she had to read the colours and she couldn't do it. And I was like laughing 'cause it was so funny"

"..[he] seemed kinda like a retard (laugh)"

[in response to a fantasy, described as a real event, of smashing the experimenter's clipboard]: "...it was a very liberating thing to do and it was so funny to see the look on that person's face"

The focus of Aggressive Humor meant to entertain is the same as described above, but these statements attempt to make the listener laugh as indicated by the presence of some form of joke work.

Examples:

"So I have no idea what this girl was asking me to do(?). (higher tone:) She was just blabbering away and I was like still drunk, I was like, 'Ya, ya whatever." (eh-ag)

"So, on the video this goofy looking guy"

"they were asking him really simple questions. Like, come on you moron! What are you doing?!"

"..this person comes on and clearly its an actor 'cause she can't act for nothing! We are talking soap o-per-a reject."

Coding Avoidant Humor

This category is meant to capture humor that functions to avoid or distract one's self from events that are perceived as stressful. This category includes humorous attributions about events that are tangentially related to or have nothing to do with the situation in the lab. Perceiving events that are the obvious product of fantasy as humorous are also included here except for descriptions of finding humor in

fantasies that contain aggressive themes. These are coded as instances of Aggressive Humor.

Example:

> "I kept thinking about that uh, psychology experiment (laugh) where the guy kept screwing up and the guy was laughing all the time"
>
> "...we did this experiment and the word cock came up(?) and I just thought it was so funny because um.. you know how we said the only reason they were together is a-la-la-la, sex must be good and stuff? And the word was cock and I just thought it was so funny because I kept thinking of how mean he's being now towards you and how like it doesn't .. ah how weird he is and stuff (?)."

Instances of entertaining Avoidant Humor include canned jokes or humorous comments that are only slightly or completely unrelated to the situation in the lab. Included here are all expressions of imagined humorous events that are expressed with the intent of making the listener laugh.

Examples:

> "I was going through the whole thing, just in the middle there (laugh) this uh....just a...uh... one of the uh you know that chick Julie? Well we're working out that one, one thing there ..well the hippopotamus came in (laugh). (quickly): Oh yeah, Oh yeah. It wasn't your regular hippopatamus, this was a green hippopotamus. And uh the green hippopotamus (laugh)...oh man"

"So I go into this room and there's a mirror and I know it's one way. So I thought of doing something silly like picking my nose in it or something (laugh) just to see what the person on the other side would do"

"I just wanted to say, uh, I'll pick you up and I'll be in my leopard thong. And uh..hope to see you with your whips and chains."

Coding the Humorousness of Participants' Stories

The humorousness of participants' stories reflects primarily the extent to which the story is successful at arousing mirth in you, the listener. Rate the overall humorousness of the participants story according to the following criteria:

Score	Category	Definition
0	Not Humorous	No attempt at entertaining humor (e.g., a matter-of-fact description) or Attempts to be funny but consistently fails
1	Slightly Humorous	Contains some successful attempts at humor, but fails to arouse mirth more than succeeds
2	Moderately Humorous	The majority of attempts at humor are successful, but the impact is diluted by the inclusion of non-humorous content (e.g., long descriptions of irrelevant details,

		the story starts humorously, but the humor tapers at the end)
3	Very Humorous	The majority of the story content communicates humor and the majority of the attempts at humor are successful.

Story coded as Not Humorous (0)

Ah Harry. Today I went to ..um do some psych research thing. And ..I like, ..actually this was my first time going inside the building, it was like, you know, it was interesting , kind of funny. It's kind of got a lot of stairs and it's got a weird design to it. And.. I went in there and found the elevator. Went up this elevator. And started to just wait there. And then the lady came to ah start the research thing. And we went to this center where its like small rooms. And it's like a maze, sort of. It's got, I don't know, kinda.. kinda queer thing to it, kind a weird thing to it like going through so many doors and just (laugh) it's sort of like, you know like, one of those dreams where you have so many doors ...uhm, lots of possibilities then. And we went into this room and we did this thing. And it's, it was quite uhm... We watched a video about an experiment and that part was kind of funny. And when I started to do this survey and .. kind of the questionnaires and stuff or the tests I did, it was kind of, kind of, it was kind of fun in a way. Like they did this reading the colours test sort of. Like we got a piece of paper full of words that described a color and I was supposed to just read the words and stuff. And its funny how, um, you can't ask, you see different colors then you read the words that mean another thing and sometimes your mind just wants to see the words of the colors. It's.. like, its weird. OK. So. Ya, ya, I don't know. It was kind of fun --that was. Then the words after that, .. uhm, 'cause I didn't know much words, I can't really solve the question to

answer. But ..mmm. What else? I guess that's about it. Okay. Bye.

Story coded as Slightly Humorous (1)

Hello, I was in the lab today doing the psych experiment and ah, I was watching it on TV before the experiment started. We were in this little room and the experimenter asked me to watch this video and I could see that it was the room that I was sitting in at the time and so I knew it was, that it was going to be me in a few minutes doing what the person on the video is doing. So anyway, on the video this person's sitting down and there's a video camera obviously recording them and they were asked to do some tasks. One of them was to read a sheet of letters red, green, blue sheet of words right across the page, had to be maybe a hundred of them and you had to say the words in order ...you know you had to do it as quickly as possible. I'm thinking as its going on , 'Yah that's not so bad. I can do that. That's fine'. And then the next sheet that comes up it's the same thing – red, green, blue right across the page only they're colors and you still just read the letters as they are, read the words as they are. So I did that. The first person on the video did that and ah that's the end up to that. And then, then they put them up with colors, you had to say the colors themselves. So the red word.., the word red might be written actually in blue font and that sort of thing so you had to say the color and not the word and that you know, the guy seemed to be okay with that. He didn't have too many problems, and I was thinking, 'Yah, that's not so bad. I think I can do that.' So then that went on and then there was a break and the next thing they had was sort, sort of word recollections of word association, I guess. Then the experimenter said three words and you had to say the one word that linked them all together. And the guy - I thought he was kind of dumb. Like he was missing a couple of them that I seemed to know right away and ah actually a couple of them I couldn't even hear like the video was kind of muffled and I thought I could, you know, I thought I could

handle it. Yah I 'm pretty good with this vocabulary I could handle that no problem. So that's cool. So that was done. And the last one they needed was count backwards from 7740 I think in groups of 13. And I think, 'Oh shit my math isn't that good.' So I don't know if I can count backwards very well. So, I thought this would be a representation of what I was going to get not the real thing. So then we were still watching the video and we sit down and it's my turn to do it and it's exactly the same, the same process like the red green blue thing and all that stuff. And I read through the sheets fine 'til I got to the ones where the colors were different. You had to see the color and not the word. Jeez! That's really hard! I couldn't believe how difficult that was. Because I thought, I thought I could train "train myself" to look at it and just you know look at the ...screen ignore the letters and just say it if it was , if it said blue and the letters were in green I could just say green ...Well I could if I was really slow. And I didn't realize I had to read the whole sheet. It took me forever so it was a lot harder than I thought it would be. And then the word association , I, I really made a fool of myself . It was terrible. I couldn't even get.. I think I got two of them or one of them out of fifteen in three minutes. I couldn't I .....on all of them, I.... That was really.. that really disappointed me. I thought I would do a lot better than that and then counting backwards from thirteen I thought I did okay on that., better than I thought. So over all they did a mood assessment before and after with a questionnaire that I filled out before I actually did watch the video and did the experiment so that afterwards... And it was the same set of questions for both. And they asked me about my mood, how I felt at this time ...and I know it changed from before and after 'cause I was really, I don't know my mind changed, my whole mood changed after I didn't do so well . It was kind of disheartening, actually. So anyway, that was what went on today. It was worth my credit I guess. Oh ! And there was another thing at the end. They did a word association that that the experimenter said a word and I had to say a

word. It wasn't as if it had to match with anything just whatever I thought of was the first thing in my mind. And I don't know if it was intentional or not but some of the words seem to be ah...while they were sort of, I don't know, I could draw, the first thing that was in may mind probably wasn't the most suitable thing to say. It was sort of like a sexual connotation for some of them. I rather not say that at the time, so I let that thought pass my mind and let something else pop in, but for the most part they were pretty clean and most of my answers I think made sense. So we'll see what happens next. Anyway that's my experiment for today. Talk to you later.

Story coded as Moderately Humorous (2)

Hello, how are you. I just got back from my psych experiment. Ya. I was waiting and I waited about an hour because the man who went before me was late. When I was waiting, one poor girl kept coming out and asking for the same person. His name was Steve. And no matter which guy came it wasn't Steve and then one woman came along and collected all the guys and took them upstairs and she was so sad and it was her last person and she wanted to go home. I felt bad for her. Eventually she left and then it came time for me to go in. And like I said, that place is a maze. It's like a rat maze. You just go around all these straight walls and narrow corridors with those ugly ugly sixties designs on the side that happen to be everywhere through the school. Ya. So I go into this room and there's a mirror and I know it's one way. So I thought of doing something silly like picking my nose in it or something (laugh) just to see what the person on the other side would do. But uh..Ya I got videotaped so.. it's my first chance to of being a model on TV. I watched other people.., actually just one other person do it first so that I knew what I was going to be doing, but that was okay. The first exercise was right out of my textbook. So I thought "Oh no! This is going to bias my judgment and stuff.' So I thought about not doing that

one (laugh). But then that's not right of me, it's not my decision. So I just mentioned that I had seen it and stuff. But uh..the girl in the video was (laughing:) making faces into the camera when she didn't know something, or things like that and the lady on the experimental person's place sounded exactly like the experimenter. All calm and relaxed and speaking slowly so the person can understand and I thought, 'This is just like a video I'd watched on the Learning Channel or something'. It was really interesting though 'cause I did the exercise and I knew how I'd do at it, the first one, the reading one. But there was this one about words and no word would pop into my head and I'm thinking "eeeya' - trying to match the words and you know how I am with words - I love to pick the right word. But I couldn't get these ones and it was driving me crazy! (laugh) That's okay. So ya, I finished it and then I talked into the phone to you (laugh). 'Cause I imagined you're there and you know my imagination, but it's supposed to be funny. So I don't know. I'm not a funny person so..., but it was fun. And I can't wait to do another one tomorrow, but I don't know. We'll see. Okay, I'll talk to you later. Bye.

Story coded as Very Humorous (3)

Okay, so I'm doing this psych experiment, right (?). I'm being the good little lab rat boy, you know going to get my extra credit for psych class and I show up at this building and thing is like a labrynth, can't find my way to class. I'm walking (laugh) class, can't find my way to the psych experiment. I'm walking around, trying to find my way through a maze. I'm thinking maybe this is the psych experiment see if I can find my way there for a little bit of cheese of something. Anyways I get there, I'm a little late, no big deal. I walk into this room and there's a big fat video camera staring me in the face, right. So I look at the camera no big deal you know, I'm a performer, I can handle this, right? So I sit down and all of a sudden I've got these questionnaires in front of me, right. Hmm...let me think, 30 different ways of asking me if I'm happy or sad.

Am I happy or sad, am I happy or sad. So I'm a happy guy. I fill the things out blah, blah, blah and then I watch a video. So on the video this goofy looking guy, filling out a bunch a.. not filling out, doing a bunch of things you know, answering this question answering that question trying to see if, I don't know, he's smart or dumb that day or something like that. So he's sitting there answering the questions being a goof-ball making faces at the camera and I'm watching, no big deal, and then they start asking me the same questions. So I'm sitting there being a goof-ball in front of the camera, right(?) - reading these words (laugh) and feeling like an idiot because I can't even speak any more. Trying to name a bunch of colors, at 30 words a minute or whatever it is. So that's no big deal either. You know I'm all done with that. (laugh)....Now they put me in this room that's supposed to look like my house – couple of posters on the wall and two lamps and a phone. Yah, this looks like my house.. (laugh), almost look like my house. Anyway, so now I'm just chilling, talking on the phone to nobody, uh which is pretty much normal I would think ....is this like imitating life or something? I don't know, anyways..I guess this thing will be over anytime soon, as soon as I hang up the phone.

Appendix I

False and actual norms on stress tasks

	False Mean	Actual Mean	SD	Range
Stroop Task:				
Black & White (# words/30 sec.)	110	78.75	10.68	53-110
Read Colour (# words/30 sec.)	110	74.59	12.77	40-105
Name Colour - Accuracy	110	102.70	2.69	97-110
Name Colour Time (sec.)	45	104.34	18.48	51-155
Mental Arithmetic	10	2.75	2.18	0-13
Remote Associates Test	10	2.53	1.7	0-7
Word Association Latency (sec.)		2.11	.69	1.25-4.44